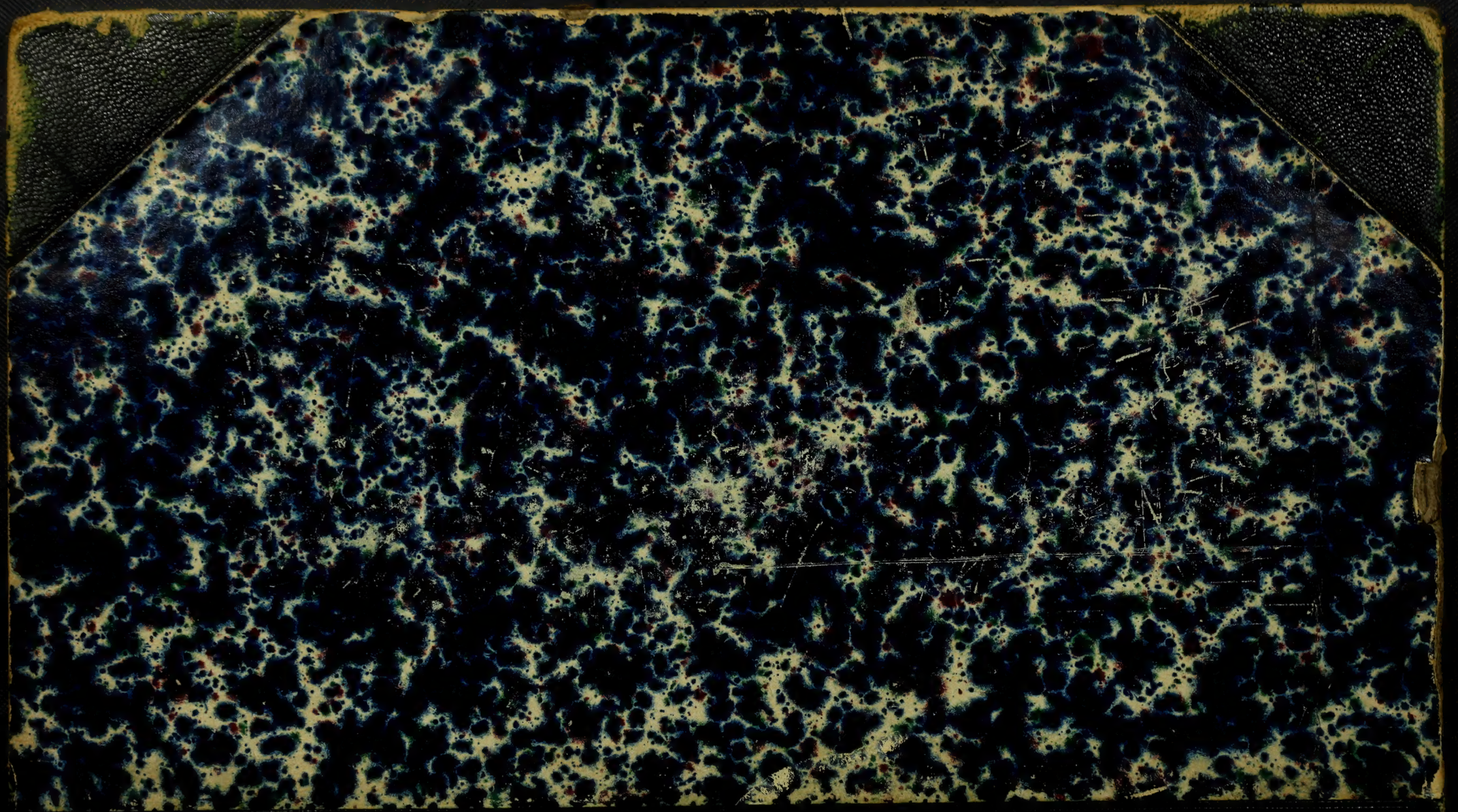


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THE BUILDING NEWS

AND ENGINEERING JOURNAL.

SITE AND SURROUNDINGS IN ARCHITECTURE.

THE environment of buildings has been a great factor in architectural development. We should never have had a Parthenon if it had been in close proximity to other buildings, and we are certain that none of the great cathedral churches, like Lincoln, Salisbury, or Amiens, would have enjoyed their fine proportions if they had been designed for narrow, restricted situations. Instead of a grand and noble plan contained within an exterior of architectural pretensions, the architect would have been hampered, and only one or two fronts would have been visible. It would have been a walled building without external expression. The art confined to the design of façades would have lost all its interest to the beholder, as the plan, whatever it was, derived from the area of ground at disposal could not be expressed except on one or two sides. The dome, the outgrowth of the Greek cross, the tower of the cruciform church, the apse and the chevet, the noble grouping of transepts and western towers, have each been derived from an unrestricted building site. The history of architecture has been as clearly written in their ground-plans as in the style of their windows and mouldings, for the ground-plan was the first embodiment of the idea, the religious creed or the social requirements of each age and people. Divest one's mind of the idea of plan, and architecture would be simply a question of fitting up interiors without any leading motive to give form and shape. What, then, becomes of a large proportion of buildings which have to be erected upon sites that restrict the architect—those, for instance, built in our streets, where a certain irregular plot of ground has to be covered in the most economical manner? They are little better than architectural fronts in which Orders, single or imposed, or an arrangement of Gothic or Renaissant features, are introduced. The interiors alone of these buildings claim attention. To be able to look all round a building seems to be one of the necessary conditions of good architecture. In other words, we look for solidity, stereographic effects in every building worthy of the name; in the architecture of streets we merely get a façade either tall or wide, without any definite idea of proportion—we have a front which may be a mere skin or veil for a very commonplace structure within. Hence, we cannot wonder at the desire of architects after a central or predominant feature in town buildings—a roof, or a cupola, or a gable—something that will exhibit solidity and perspective of lines.

In London and other large towns we lose this essential quality of architecture. There are few great quadrangular structures in our open sites. St. Paul's Cathedral, the Bank, the Royal Exchange, the Mansion House, Somerset House, the Law Courts, the Palace of the Legislature, owe their importance and impressiveness, not altogether to the fact of their dimensions—although it is something—but to the circumstance that they stand out distinct from other buildings, that we can pass round them and examine their sides, and take in several aspects of them, that we can scan their perspective lines from many points. We require to be able to go into them and find that they are spacious and self-contained, like a cathedral or the cortile of the Royal Exchange, or Somerset House quadrangle, to be able to appreciate their pretensions. The condition of isolation is absent in our modern town buildings. If a site is selected for a town-hall or museum, it is a rare chance to find that the building can be seen from more than two sides, as in a corner site; often only one long front is possible, behind which the building is made up of large and small apartments struggling for light, which can only be obtained by providing areas or well holes, and in placing the main halls and rooms in positions which would never be tolerated if the architect was free all round. Take many of our municipal buildings, where the site is partially inclosed, and observe how they would appear if the side buildings which now obscure their sides and backs were to be removed. How would they look if they stood bare, with the meagre walls of the great assembly room, the ungainly roof, the plain windows, the ugly light areas and crude brickwork, the façade only appearing in all the pomposity of some Venetian palace? Added to which the bare ugliness would be intensified by the gaunt ventilating cowls or tubes such as rise out of roofs of assembly halls and theatres, like those of Exeter Hall, St. James's Hall, and most of our theatres, which are visible from a few vantage grounds, or from any lead flat in their vicinity. A glaring example of this sudden denudation—this stripping of the surrounding buildings—is the National Gallery, with its blank flank and posterior walls, which were exposed when the old houses surrounding it were demolished for the new road from Charing Cross. That building, though commanding the "finest site in Europe," was designed, or rather enlarged, with a paltry idea of economy, and without the faintest idea of future probabilities. We have in it a warning to other promoters of public buildings on closed sites, of the dishonest kind of art which lavishes all the ornamentation upon one façade, reducing the other sides to blank walls. We can name half a dozen public structures, built at great cost as municipal buildings, which are painful exemplifications of this rule. Even church and chapel builders on partly concealed sites have availed themselves of this excuse for curtailing the cost and character of their work. The failure has been the same—that of making the building to suit the site, instead of selecting a site that shall give free play to the design; for the principle of designing a plan to meet the requirements of a site may be carried to a degree that scarcely befits the dignity of an architectural composition, especially when it is applied to churches and other monumental structures. Here, indeed, good taste ought to decide the limits of restriction, or to what extent the building should assume an integrity and importance above its surroundings.

The principle, then, that isolation gives importance to a building is one of those canons which architects are, from various causes over which they have little control, disposed to underrate. All our greatest public buildings have necessarily been erected on sites more or less open. From the examples in London we can name several in provincial towns. Liverpool St. George's Hall and the Manchester Town Hall are two notable instances of the principle applied to two structures, one severely Classic, the other in the Gothic style. The latter is unique because of its triangular plan. Arising out of isolation is the principle of grouping. We cannot have the latter without a well-emphasised plan. Again, to take the cruciform church plan or the Greek cross, which furnishes the noblest examples of architectural grouping we possess, we may at once see how unimpressive the same area of covered building would be if it were extended along one axis or front. It is the relative planes on which stand the three great towers of York, or Lincoln, or Lichfield, the pyramidal outlines of such noble structures as St. Peter's or St. Paul's, or the mass and intricacy of parts which appear in the composition of St. Sophia on the Greek plan, which contribute to the effect of grouping. But the modern building, confined within a long or rectangular site, has no means of expressing itself as an organised plan, and therefore it loses its great power as a composition. There is no chance for grouped effects in our streets, unless it is in the form of a large quadrangle or square; but the chances for this sort of effect are, unhappily, very rare, and we shall rarely have again the sites to deal with which Wren had in his

design for Greenwich or Chelsea Hospitals, or Chambers had in the site for Somerset House. We might mention many instances of grouping, but our limits do not permit. Suffice to add that the street site does not afford the opportunity. There must be depth as well as width—return wings, blocks of the shape of half squares, double quadrangles, and other forms of like shape to enable the architect to bring his features in some sort of relation to each other.

We can point also to the want of agreement between the site and the building, and in this connection may draw attention to the want of harmony caused by the curvilinear or undulating lines of the landscape being spoilt or obscured by rigid building lines. Need we instance the rows of houses which sometimes cut off the natural beauty of the hill, or quite destroy their harmony of lines, noticed in many of the newly-built suburbs in the vicinity of London, where the undulations of the landscape are completely blotted out by rows of ugly slated roofs, sometimes stepped up the incline, or defiantly breaking the natural contour by straight lines of roof and chimneys? Space does not allow us to enter upon so wide a theme as that of landscape in its relation to architectural design. In another article we shall give some glaring instances of broken landscapes, and how the architect can lend his art in combining with and imparting interest to the natural surroundings. It is singularly unfortunate that the planner of modern building estates is allowed to spoil the sites on which he works, and that competition designs should not be obtained before a plan of roads is irretrievably fixed. After the estate plan is arranged, very little can be done to atone for the spoliation of the site. The houses have to be built in lines that cannot be altered, whereas if the plan had been designed in relation to the contour of the ground, there would be an opportunity afforded of making the buildings harmonise and group with the natural landscape. In the design of the buildings also very little is attempted to produce agreeable lines or combinations. Legislation has done scarcely anything to aid the hands of the artistic layer-out of estates, and, in the mean time, our finest sites are yearly sacrificed to the commercial undertaking.

THE ROYAL SOCIETY OF BRITISH ARTISTS.

THE invitation of this society to friends and members to contribute works of art towards establishing a reserve fund, has met with a handsome response. The fine collection of oil pictures, water-colour drawings, and sculpture given for the purpose are opened to the public view this week. We congratulate the Royal Society of British Artists on the success they have achieved, and the heartiness and sympathy which artists of all ranks have evinced towards the success and prospects of the society, whose career has been somewhat chequered of late years. In the water-colour room the contributions are varied, and of value. We see drawings, studies, and sketches by Sir Fred. Leighton, Bart., P.R.A., Miss Nora Davison, David Green, A. Hugh Fisher, G. G. Kilburne, W. Harding Smith, W. Matthison, Hubert Vos, N. S. Crichton, Harry Tuck, Berry F. Berry, A. Denyer, J. M. Bromley, Miss Grace H. Hastie, Wyke Bayliss, L. Wyburd, D. Law, Alfred Powell, L. Rivers, Ernest George, F. P. Barraud, A. W. Weedon, A. Poncy, A. Kinsley, Will Anderson, and other well-known artists. It would be unnecessary to individualise, and we, therefore, can only name a few of the works. A nice, sharp sketch is sent by Miss Nora Davison—"On the River at Bristol" (7); and some fresh colour and sympathetic rendering is shown by David Green in his "Old Landmark," a sketch of Whitby. "Summer Evening," by W. Matthison (11), is also a feeling study of river scenery; below which David Law's proof etching of "Edinburgh" will be valued for its tone and expression of atmosphere. A connoisseur seated studying a picture on an easel, is a pleasing piece of *genre* by G. G. Kilburne. We must notice also a study of a girl's head by Hubert Vos, "The Convalescent," thinly painted on a fine silken ground; the grouping and colour in N. S. Crichton's "Chateau of Rankel"; the freshness and breadth in Berry F. Berry's "Surrey Cornfield," in which the gradation of colour and the perspective in foreground and distance are cleverly rendered. A nicely-drawn figure is sent by Harry Tuck, "Going to Market," and a small but effective sketch of "Lincoln from the Witham Bank by Twilight" (27). Further on the study of "Chrysanthemums" (34), by Miss Grace H. Hastie, and Wyke Bayliss's "Interior of St. Sebald, Nuremberg," are notable additions. The same artist's grand drawing of the west porch of Ratisbon Cathedral (116), and its triangular plan, cannot fail to be noticed for its subtle rendering of colour, light, and shadow. A grey sketch in local tint of "The Silver Sea," by Nelson Dawson (40), and the sketch by Sir Fredc. Leighton of his Academy picture, "Greek Girls playing at Ball" (45), on brown paper, are valuable contributions, the latter none the less so because it is on a small scale. We can add to these Alfred Powell's "South Downs" (50), a charming study of undulating hills, gorse, and heather. Leopold Rivers's "Mill on the Hill" (51), a piece of solidly-handled work and nice colour. Walter J. Morgan's "Sally" (59); Miss Eleanor Brace's "Tomb of Sir Francis Vere, Westminster Abbey"; G. Tinworth's modelling in terracotta of "Philip and the Eunuch" (55); a broad sketch by Henry C. Fox; a sketch by Mrs. Roughton, of "Field-court, Gray's Inn" (77); F. P. Barraud's drawing of "Oudenarde" (83); A. V. Poncy's large and broadly-treated landscape (94); Ernest George's "Street in Algiers" (95), Albert Kinsley's soft and simple washed sketch of a birch glade (115), and works by Owen Hale (106) and Mrs. Travers (111).

In the large room several oil pictures by eminent painters are hung. G. F. Watts, R.A., sends a masterly study of a girl's head turned sideface, remarkable for its expressions and colour; Yeend King a charming coastscape, "The Coastguard's Cabbages" (128); Charles Eyles a broad sketch of boat and sea, "Sandwich" (123). The warmth of colour in his sketch of "Surrey Hills" (135), by Wm. Linnell, is pleasing. There is poetic charm in A. Verey's "Kentish Idyll" (126), and in Miss Davis's flower subject, "The Last of the Season" (130). A. de Breanski has a feelingly-painted subject, "The Pool at Burnham"; Chas. E. Baskett a study of fruit (142), rich in colour; and H. T. Schäfer sends a delicate study, "A Corner of an Old Garden" (145). "The Sad Sea Waves," by C. A. Smith, is fresh in the colour and handling of sea, and a broad touch distinguishes Stuart Lloyd's "Devonshire Hamlet" (158). J. S. Noble sends a clever study of cattle and sheds (168), under a winter sky, and some excellent work is found in Miss Lara Follen's "Onions," in Thos. Roberts's boy with flute (171), and in H. E. Christie's sharp and clear evening landscape (173), "The House on the Hill." Ernest Moore's "On the Seine" is cleverly handled in the reflection on the water.

Several small cabinet pictures are hung. We notice Geo. Fox's "The Tinder Box, a Light of Other Days," Mrs. Julie Frigout's study of "Birch." F. G. Crone sends a landscape of merit, G. H. Calderon, R.A., one of his finished studies, "Abbandonata" (181) is a reclining figure, with much expression and grace; and there are some other sketches by R. W. A. Rouse, L. C. Henley, G. E. Hicks, &c. Haynes King's "Coming Home," a study of fisherwoman with child; W. E. Norton's fine rendering of "Whitby Harbour" (191), the broadly-handled landscape "Rainy Weather" (194), and W. S. Jay's "Autumn Gold" (197) have qualities which place them high on the list. A feelingly-painted landscape is sent by H. Maurice Page (206), and we note a forcible head, "An Exile," by Miss H. E. Grace; and a lightly-painted subject by J. Whipple (214), "On the Cliffs, Southwold." J. S. Hill sends a large sea view, broad and sympathetic in handling (230); and we cannot pass by without admiring the exquisite interior given by Miss Jessica Hayllar in her own most delicate and realistic manner, "Cupid and Psyche." P. F. Walker contributes a seascape (222), J. Hayllar a figure subject, "Italian Peasant" (241); Miss Isa Thomson a feelingly-painted subject, "The Dying Fire" (257); V. P. Yglesias a charming coast view, "Sea Holly, on the Suffolk Coast," a clever study of the blue-flowered holly in a low key of colour; the Hon. Stephen Coleridge, a bright Venetian lagoon; and further on the president has another charming architectural subject, the Cloisters, Salisbury Cathedral. There is much graceful drawing in Miss Gertrude Homan's figure subject (275), breadth and force in such works as James Peel's "Grasmere," H. G. Moon's "Early Spring" (282), and C. J. De Lacy's "London River" (283); but we cannot enumerate other works of lesser interest and merit, which together make a fair exhibition, and show the heartiness with which the friends of the Society have come to its aid.

THE KINGSTON-ON-THAMES SEWAGE DISPOSAL WORKS.

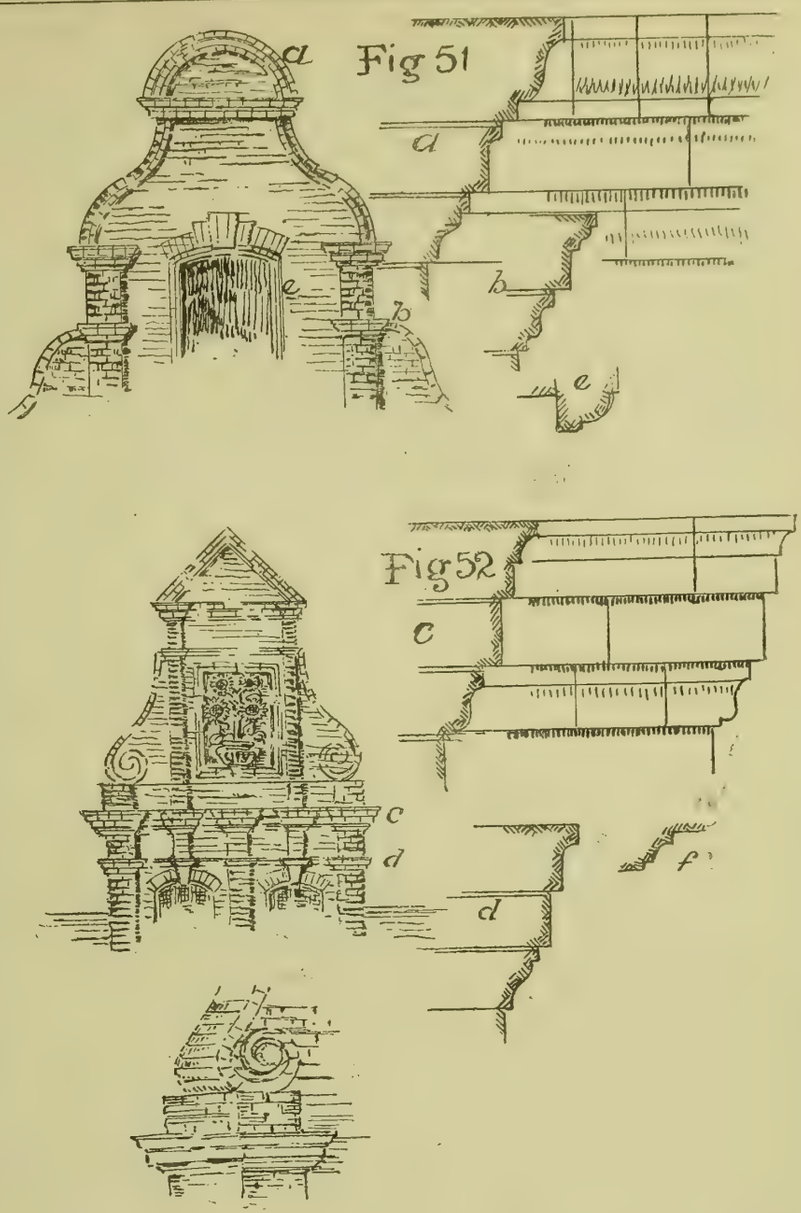
ONE of the most successful applications of a precipitation process to the sewage of towns situated on the banks of rivers which have to be preserved from impurities and jealously guarded for the sake of the large communities living on or near their banks, both above and below, has been made at Kingston-on-Thames. The guardians of public health have a difficult task before them when they have to prevent the contamination of a stream below which large populations dwell, and from which the Metropolitan Water Companies draw their daily supplies. As our readers are aware, the A B C process employed by the Native Guano Company, long in operation at Aylesbury and Wellington College, has been before sanitary authorities for many years. The process has been found to fulfil the requirements of the Rivers Pollution Prevention Act and to be without injury to fish, while the operation can be carried out without creating any nuisance in the immediate vicinity of the works. After much expensive litigation and abortive attempts, the Kingston Corporation at last have carried out this process at their new works, which are situated near the river and close to the South-Western Railway. The opening of the new works took place last Saturday, when a large number of gentlemen interested in sanitary matters, borough engineers, and others inspected the works and witnessed the operation. The first attention of the visitors was directed to the well-built brick building which stands not far from the railway, and is fitted up with the necessary machinery and pumps. The screening chambers and pump-room are devoted to the first operation. The Kingston sewage passes through the former, and is there cleared of the coarser matter which it contains; it then enters the pump-well, where it is deodorised by a mixture which arrests all offensive odour and acts upon the dissolved and suspended impurities. Three

pumps on the centrifugal principle raise the sewage after this preliminary deodorising process and discharge it into a meter of special construction, by which its volume is measured, and it is then discharged into an open channel which carries it into a series of settling tanks. On its way thither it receives the dose or allowance of precipitating agents. The two engines which drive the mixing mills and other machinery are each of 40-horse power on the triple-expansion principle, and are on the Willans patent central valve system, the Corporation of Kingston being the first to adopt the plan. These engines and pumps, with subsidiary apparatus, have been put up by Willans and Robinson (Limited), of Thames Ditton, in accordance with the plans of Major Macaulay, borough surveyor, and have several advantages. They can be run at speeds which ordinary engines are incapable of performing. These engines are non-condensing, and work with 150lb. pressure. The three large pumping engines are each capable of raising 100,000 gallons of sewage per hour, in addition to three smaller ones for pumping the Surbiton sewage, each capable of raising 45,000 gallons per hour. The lift required for the Kingston sewage is 12ft., that for Surbiton sewage being 13ft. One great merit of the Willans engine is the small space it requires. The engine-room is only 25ft. by 14½ft., much less than would have sufficed for ordinary horizontal engines. The driving engines run at speeds of 450 revolutions per minute, and can be coupled direct to the centrifugal pumps. The series of precipitation tanks which receive the treated sewage are eight in number, arranged in two rows of four tanks each, with a pathway between the rows. The tanks are each 85ft. long by 50ft. wide, and of 6ft. working depth, holding 150,000 gallons each, or a total capacity of 1,200,000 gallons, equal to 30 gallons per head for a population of 40,000. Through these tanks the sewage flows, and precipitates its heavier matters as it passes from one to the other. A board for arresting the flocculent matter is fixed across the entrance to each tank; the liquid then passes round the division wall, and as it leaves the first tank for the next it is perceptibly clearer. The supernatent liquid is drawn off at the surface of the tanks into a channel which is carried to the outlet. The effluent, as we observed it, was quite bright, colourless, and without odour. After leaving the tanks two parallel open channels convey it to the outlet. Before it passes underground the channels enlarge to two wide sloping floors of brick, by which the effluent is spread out into a thin sheet of water, thereby oxidising it to the fullest extent, and causing it to run with some velocity and turbulence into the lower end of the outlet.

These tanks have been constructed thoroughly well, and are models of arrangement and execution. They are all on the same level, and can thus be used alternately or collectively. The ground on which they are formed has been embanked all round. The walls of the tanks are made of concrete, specially prepared by a concrete-making machine, which guarantees a uniform proportion of the materials being used. These walls are faced with bricks round the tops and cemented below, and coped with Staffordshire blue bricks moulded to a pattern which gives a substantial and neat appearance to the work. For drawing off the clear water from the tanks a floating arrangement of tube is fixed in each tank. The total cost of works and buildings was £23,000.

Of the practical results accomplished by these works we can only speak from the facts and assurances we have learned. The sludge in the tanks is pumped by a Tangye-Holman double-action pump into a large sludge-well at the rate of 500 gallons per minute. Four cylindrical vessels outside the building, and called the accumulators, receive the sludge by the action of a vacuum; from them it is forced by air pressure into eleven specially-designed filter presses on the upper floor of the building, where it is pressed into cakes, dried in a drying cylinder, and then ground into a fine powder, and sold in bags as native guano at £3 10s. per ton. We may state the process is worked entirely by the Native Guano Company, at their own risk, the Corporation having built the structure and tanks, and paying the company a subsidy, said to be equivalent to about 1s. per head.

The Surbiton sewage is separately dealt with by the same process, and we hear that Hampton Wick is about to send its sewage to these works for treatment. The works were designed for treating the sewage of 35,000 people, but they can, with slight additions, be made to meet the requirements of a population of 50,000. At present the works deal with the sewage of both Kingston and Surbiton, or a total population of 38,068. The works have been carried out from the plans of the borough surveyor, Major Macaulay, and Mr. Charles E. Robinson, M.I.C.E., on behalf of the Native Guano Company, Mr. William Cunliffe, of Dorking and Kingston, having been the contractor. Messrs. Holroyd, Horsfield, and Wilson, of Leeds, supplied the presses, &c.



ARCHITECTURAL BRICKWORK.—XIII.

GABLED AND MOULDED WORK.

IN our sketches we show other examples of brick gables and moulded details. At Chelsea, Kensington, Streatham, Bromley, and Beckenham the student of brickwork will find every variety of cut and moulded work, and several specimens of well-designed and executed gables. The mode of arranging the members we have explained in our previous articles, and the sectional profiles we now give, *a*, *b*, *c*, *d*, *e*, &c., furnish other very effective mouldings. In important buildings the architect will find it an advantage in substituting for the upper coping of bricks of ordinary size, large moulded bricks or terracotta blocks, in which portions of the moulded members are cast. Economy and accuracy of line will suggest this substitution in large works. In our sketch of dormer gable (Fig. 52) we illustrate a common form of treatment, in which gauged brickwork in the form of trusses appear. These would be preferably formed of terracotta, cast in one or in more blocks, the lower one being moulded with the entire volute. Within the space formed by the pilasters is a terracotta flower-panel in relief, composed of eight square tiles, about 1ft. 6in. square, surrounded by a moulded border.

For the cornices and stringcourses, the moulded bricks are sometimes placed as stretchers, breaking joint at every course, though better bond is secured by alternating the courses as in ordinary brickwork. Ornamental friezes in square slabs are manufactured of the whole depth from 9in. to 1ft. 3in. in length. For the corners of moulded architraves and borders special bricks are made, forming the angle mitres. As an example of Mediæval brickwork of this description, that of Someries Castle, near Luton, may be mentioned. Here the corbelling at entrance filling up the square angle may be especially noticed. The angle corbel in profile consists of a double ogee or wave-moulding cut to the curve and constructed of horizontal courses; the lower springing course is carried on a small trefoiled arch across the angle, and the upper part is enriched by a range of trefoiled arches on brick trusses. The moulded brick jambs of doorway to chapel and window-jambs are good examples of moulded brickwork. The size of the bricks is about 9in. by 4in., and 2in. thick, five courses making the foot. A few notable specimens of Mediæval brickwork occur in Pomerania. We may allude to the fine arcade at the Marien Kirche, Stargard, and also at Stettin, where the arcades of the front are composed of Flemish bond of moulded brick tracery. The bricks are large, some measuring 11in. by 5in. by 3½in., the joints at least ¾in. thick. In an interesting paper read by Mr. Tavernor Perry at the Institute in 1873, and reported in this journal, the author drew attention to the brickwork of this German district. Adler's treatise on the Mediæval Brickwork of the Prussian States enters largely into the subject. The brickwork is often of the plainest description, but modelled with much delicacy and sharpness. A large variety of design is produced by a combination of a few simple patterns—ovolos, hollows, and the like. Cusped circles are common, and are frequently met with in surface panelling or tracery. At Stralsund are found several churches and houses of pretensions executed in this material. The pillars in St. Nicholas are of brick, except the bases and capitals; the groining of the brick quadripartite vault contains excellent moulded ribs; in other churches the piers are plain, and the arch ribs are of plain splayed bricks. In some churches are to be seen rather rough brickwork, exceedingly crude in the execution; often the brick vaults are ribless, and there has been evidently a desire to economise.

With our facilities for brickmaking and moulding, better results can be anticipated. The chief obstacle we have in the production of architectural brickwork is the competition in other materials like stone and terracotta. In Germany, stone in those districts had to be transported from a long distance, therefore there was no other alternative but to use brick, and every inducement was given to perfect its manufacture, as we find in the church of St. Mary, Stargard, where each brick detail is specially moulded for its position. The increased attention paid to brick-cutting has promoted brickwork of late years, and a considerable progress has been made in the details of the art. Take gauged work. We now find scrolls and volutes for capitals and trusses executed with nicety. In this case the bricks are put together in a block resembling the shape required, and then cut to the plan and finished by the file. The side volutes are traced on paper and fixed to the sides of block, and the lines cut through. Zinc cut to the pattern is often put on the brick block, and the design traced. In the cutting the bow saw is largely used in work of this description, and the readiness with which it can be applied has reduced the labour in gauged work and arches. The architect must be the right judge as to the positions and features which are best executed in gauged work. As a matter of taste, we think it should be confined to the ornamental parts of the façade—those that are to receive the highest degree of finish and are protected from the weather; in short, gauged work ought to hold a similar relation to the plainer and moulded work that terracotta does to brickwork.

AN EVIL SYSTEM.

By ARTHUR LEE.

THE manner in which a nation is housed has a direct effect upon the physical condition and the moral tone of the people. It needs no argument to prove that a badly-built house is injurious to the health of its inmates, or that a home with squalid surroundings is a direct incentive to intemperance. It seems a mere platitude to assert that the houses in which we live should be built well and under the most economical conditions. If this assertion seems a too self-evident proposition to be further laboured, it is somewhat wonderful that the system which we have adopted tends directly to an opposite result. The great mass of the houses which are built as residences for the middle and lower classes are the work of men who are known as speculative builders. Many of them are men of experience and capital who are quite worthy of the trust which is confided to them. But it is not too much to say that they are so in spite of the system under which their business is generally conducted. This system is one which discourages the builder with capital, and encourages the man of straw. It invites men to embark in a trade of which they have no knowledge, to the injury of men of experience and proper training. It encourages the dishonest schemer at the expense of the honest trader. It enormously increases the cost of the housing of the people. It sets a premium upon bad building. It is wasteful and extravagant to the last degree, and the injury which it works can hardly be over-estimated.

The root of the evil lies in the fact that the builder is usually only the nominal owner of the houses which he builds. The real owner is, in the first place, the financier who finds the money for wages and material which cannot be obtained on credit, and eventually the capitalist who invests in what is known as a permanent mortgage, and who relieves the financier of the responsibility which he has temporarily assumed. The mischief is that the nominal owner is sufficiently owner to build practically as he likes, provided that a certain outside appearance is kept up, and the temporary real owner is not sufficiently interested to employ the same amount of skilled supervision which is found necessary in ordinary building operations which are carried out by contract. Thus it is that our warehouses and places of business are better built than the houses in which we live. But if skilled supervision is needed in the one case, it is much more needed in the other. The average contractor who builds under the supervision of an architect and clerk of works is a skilful man with some knowledge of his business. The speculating builder is too often a half-taught mechanic, who is entirely without capital or proper experience. His principal aim is to obtain as much money by way of mortgage for as little expenditure in the form of ready money as possible.

The extravagance of the present system is frightful. The nominal owner is the catspaw of the real speculator, and is the instrument through whom the latter rakes in his gains. Goods obtained on credit by the one are at once pledged to the other for something less than their real value. So long as investors can be found to lend money upon mortgage who will provide sufficient funds to repay the financier the amount of his advances plus his profits, and so long as this arrangement will provide the catspaw with enough to pay his creditors, so long may the process be repeated, to the certain profit of the middleman. But there comes a time when the investor gets shy of endeavouring to obtain an income out of houses which cost their rent in repairs, or the catspaw can no longer obtain the credit which alone makes him useful to the speculating financier. Then the latter seizes the property of his unfortunate debtor, who seeks shelter in the Bankruptcy Court to pay no dividend to his trade creditors. The result is that a trade which is one of the most important in the country, one in which the annual turnover amounts to many millions sterling, is rotten to the core. Every description of material which is used for building purposes is raised in price by the percentage of risk, which is added to the ordinary trade profit. Houses are badly built. The services which could be rendered to the nation by our skilled professional men are lost. Every householder pays more for a badly-built house than he would pay for one properly constructed, if our building operations were carried on under better conditions. No single class is benefited except the army of speculating financiers, whose gains amount to a tax upon the whole community. The evil of the present system must be admitted. What is the remedy?

Something might be done by an Act of Parliament which would make it compulsory for all houses to be built under skilled supervision. The administration of drugs for the cure of diseases is placed in the hands of duly qualified practitioners. The building of dwellings for human habitation is fenced about by no such safeguard, although badly-built houses are too frequently the cause of the disease which the medical man is called in to cure.

The comfort and health of the people are concerned in this question, which demands the attention of the Legislature. Intimately connected with it is the whole status of the architectural profession. It is manifest that if skilled supervision is made compulsory there must be no doubt about the qualification and good faith of the men to whom so important a trust is given. The examination of architects and the infliction of penalties for non-professional conduct should be vested in some authority in which confidence can be placed, and it should be made as illegal for non-qualified persons to act as architects as it is for them to act as lawyers or as medical men. But the most effective remedy would be to make a mortgage of unfinished house property void against trade creditors. Under the existing law every stick and stone put into a building may be promptly pledged to one creditor to the exclusion of all others. It is this fact which affords opportunity to penniless men to engage in large speculations, to the injury of a great industry. Take away the facility for the pledging of building materials, and a great step is gained.

The colossal character of the building trade of this country may be gathered from the fact that during the twenty years between 1861 and 1881 one-fifth of the whole number of inhabited houses now in existence have been built. The result of the doing away of the present evil system would be that this magnificent industry would get into proper hands, to the benefit of all classes, except a small one which deserves no sympathy. Houses might be still built as a speculation, but they would be built by capitalists who would employ experienced and respectable men to build by contract. The skill possessed by trained members of the architectural profession, which is now, in great measure, a wasted power, would be brought into full requisition. The class of people who now invest money upon mortgage would know that they did so upon property which would be worth the holding. The reputation of the architect engaged in the transaction would be at stake. The people would be better and more cheaply housed. The cost

of proper supervision and of work which was not scamped would be more than compensated for by the increased economy of a system which would make credit given to a builder an ordinary trade risk. The change would be beneficial to every respectable member of the building trade, to whom the penniless speculator is an unmitigated evil.

It is nothing short of a scandal that a trade of such vast proportions—of such importance to the health and comfort of every man, woman, and child in the country—should be allowed to remain in its present evil plight.

"BUILDING NEWS" DESIGNING CLUB.

A VILLAGE LIBRARY.

"D" in a circle comes to the fore again, giving us a characteristic design with a touch of American go about it, which insures at least a degree of originality. "Neb" ranks second with a rather pretentious design, and not half a bad plan, while "Judge Pitman" runs him hard and scores third. These are the conditions of the competition issued to our club:—

"H.—A Village Lending Library and Reading-room for a street corner site, having a main frontage of 45ft. and a return of 80ft., all of which in depth need not be covered with buildings. The entrance may be at the angle or in either front, and a back entrance from the side street will be required. The ground-floor to comprise a book-store or lending-library room, with a public lobby and counter for borrowers, a newspaper and magazine room, a small private room for the librarian, porter's office, and two w.c.'s., &c., for men, and a similar convenience for women. On the first floor a reading-room and small reference library. The staircase approach to be from the entrance lobby. On the first floor the librarian and officials' cloak-room, lavatory, &c., should be arranged. In the upper part of the building, overlooking the main street, a residence for the caretaker or curator is to be contrived, consisting of a sitting-room, kitchen, and scullery, and three bedrooms, w.c., &c. There is to be a basement, which should provide for a coal cellar and heating chamber, store, &c. Scale 8ft. to the inch. Style, English Renaissance, simply treated, with stone-faced walls. The upper part may be plastered. Sufficient drawings to illustrate the design."

We give both the first two designs among our lithographic plates to-day, and all the faults as well as merits which they illustrate will thus be readily detected by our readers. We therefore will make our own remarks as brief as possible. Taking the selected plan first, that sent in under the motto "D," the porch seems badly proportioned, and is too wide for the depth, giving perhaps a needlessly roomy space for dust from the street to accumulate and gutter children to play in. The porter's office is placed conveniently, and commands the entrance. The w.c.'s for men are all right, though it is necessary to go down to a half-basement to get at them. The ladies' closets come too directly off the public staircase to be really satisfactory. The lending-library counter would have been better square on plan, and the inclosure need not have been so wide. The librarian's room is very well placed, commanding both library and magazine-room. The private staircase is dark; but central, and conveniently situated. The public rooms are very good indeed; and the landing is roomy without waste of space. The pitch of the top-floor rooms would be rather low, and their plan represents the areas as if there were no slopes, which is misleading. The section taken through the flues does not show them. The vertical bay windows seem to our mind out of harmony with the horizontal lines of the low-proportioned window of the reading-room and sprawling arch to the entry. The façade is not commonplace, neither is it too ambitious, and it looks like a public institution. The author is to be congratulated on his work. While we praise him and the other men whose designs take prominent places, we are not unmindful of our other contributors, and if want of space precludes a written notice of their designs, we take great pains to classify them in their order of merit, and give what encouragement we can to their endeavours. "Neb" supplies an alternative treatment for the upper part of the front elevation of his design, and we are inclined to like that better than the German sort of mansard-roofed tower, which calls for more than the attention due to so small a building. Indeed when we know that it only incloses the kitchen, we are quite sure about its being a mistake, and the scullery does not need a secondary turret all to itself. The plan is not so good by a long way as "D's," but it is better than "Judge Pitman's." The librarian's room does not adjoin the library in "Neb's" arrangement, but in "Judge P.'s" it is quite isolated, and commands nothing but the street. The porter's office in the design placed second should have had a window looking into the porch. The staircase is a little too pretentious, and the landing over is wasteful, without extra convenience, in spite of the term "gallery" applied on the plan to cover the objection referred to here. The balcony would have been all very well for a club as a members' lounge, or from whence the M.P. of the district could talk trifles or tenderly temporise with his constituents. For a public library it is not wanted. The wall of the reference library comes in an ugly way over the room below, and the lean-to top light is very crude in idea. So also is the way in which the conveniences for both sexes come out of the news-room. Nothing could be more publicly contrived, with the doors duly labelled to prevent confusion. There is a want of ingenuity in this plan. Its author's first care has evidently been the elevation. The same is to be said about "Judge Pitman." We like his elevation for its general good taste and desire to be unassuming; but somehow or other the building looks more like a public-house with an archway leading to the stable-yard behind — a fatal objection to the plan we have already named. Another is that there are two front doors, one, leading into the borrower's lobby direct, and both are without any supervision, for the porter's office is so situated as to insure his seeing all who go in and out of the ladies' w.c.'s at the back of the hall. The men's lavatory is too near that of the ladies, and it should not form a passage way to the premises at the rear. The caretaker's private staircase cuts up the reference library very badly, and the reading-room is of awkward proportions. The landing is wasteful, and the officials' lavatory is nearly as big as both those provided for the use of the public. The residential rooms at the top of the house are well planned, save that the landing would be very dark, though he might specify a skylight, not here shown. "Zodiac" is to be commended for his elevations, but we do not like his plans. Why, in the name of all that's nice, put the ladies' lavatory and w.c. doors facing the street entrance, arranging matters so that all who go into the caretaker's part of the house must pass the same doorway? The librarian's room and the porter's office are well contrived, and the hall is ample, but the staircase is ugly at the starting and too wide up above. "Tyrens" sends a ground-plan with a practical air about it, which at first sight seems to demand attention, though we can see at once that the piazza-fronted façade is out of all keeping with a village library. If anything, the building looks like a county hall. The crude details of the plan, however, on examination, are so unequal, that we wonder what sort of man its author can be. The lobby for borrowers is much too large. "Perpendicular's" design is also uneven in merit, with pretty elevations marked by taste, and poor plans disfigured by faults. The hall does duty for the borrowers' lobby, and the librarian has a pinched-up looking room between the lending library, newspaper-room, and caretaker's kitchen. The public staircase is needlessly cramped, and would, in execution come up in such a way over the entrance porch as to surprise its designer, to say nothing of the public. The absence of a section has to be named. "Streona" sticks to his work, and has improved. There is much in his design now before us to congratulate him on. The public seats outside the men's conveniences under the arches opening on to the street would not be very nice, and dirty boys would stand on the seats with a view of looking into the windows. The entrance is well designed, and the general arrangements are marked by convenience and care. "Cosmos" spoils his design rather by the perspective, which alters its proportions. The rooms are ample and square, but we cannot say that they look comfortable or specially well arranged. The reading-room inside would look all lopsided with one tall mullioned window, and one squat-arched window of similar size and importance, side by side with it. In a general way the design looks like a library. "Multum in Parvo" makes his building resemble a board school; otherwise we do not complain, even if we say that we cannot admire his elevations. His plan is better with the departments kept well together. The lavatories are inadequate and ill-contrived. "Stanley" continues to persevere, and improves in his work. His hall wastes valuable space, and the librarian's room completely isolates that officer from all command of what is going on in the building. The elevation nearly deserves to be called good, and is Old English in style, with a plaster-faced upper story and shaped gables, which, however, emphasise nothing in the composition but themselves. "Shadow" knows what he is about, and we wish he had joined our club earlier. There is an amount of originality in his design which leads to this observation. The front is marked by two great gables on one side of the entrance, which is under a low arch; a boldly projecting bay incloses the principal staircase. Under the steps the gentlemen's lavatory is placed, and the ladies' place occupies a sort of lean-to in front to the right of the porch. These places are rather cramped, and so is the hall. The caretaker's house is reached from a door at the back. The drawings are well done. "Vorwarts" does his best; but his design is incongruous, with windows of too varied a character to be pleasing. The plan shows study, and would work out fairly well. Without a proper room for the librarian, the institution would be likely, however, to go wrong. "Abacus" displays refinement and taste in his contribution, and we wish his elevations belonged to better plans. Space fails us to describe their faults; but we like the exterior treatment, more particularly the return front. "Tecton" draws neatly and designs stiffly, sacrificing too much to symmetry of plan. Thus the porter's office is made to balance with a room for the librarian, and the central feature of a tower over the entrance incloses a combination apartment consisting of bath-room, w.c., and slop sink. An arched wide opening facing the staircase on the first floor leads only to a w.c., the space outside being labelled "Cloak-room." The elevations are, in themselves, rather good, and free from ugly "features." "Signum" comes next with a design enriched with plaster-work gables. The general proportions are poor, and the plan is very faulty. "Cyclist" gives us a queer-looking façade, not without merit. His plan is marked by a love of circular iron staircases. His "gents'" place is shocking, even on paper. "Orme" will do better, and we like his front elevation, but not the side façade nor his plan. "A 1" comes next, and then "Fairy," whose building looks more like a bank. It is clever and clean-looking, and would execute well. We cannot say so of the plan, which wastes room on passages. "Horse-shoe" has never ranked very high, and we fear must have often worked on with the odds against him, so to speak, seeing that other competitors allow him but little chance at present. Still he has not given up, and this design is the best which we have seen from his hand. The general merit of the contributions sent in on this occasion is higher than usual, else "Horseshoe" would have taken a higher place to-day. We say this much to encourage him not to cease his efforts to improve. "Haste" has a curious idea of design, if we are to judge him by the front elevation which he contributes. The upper part is elaborated with panelling done in plaster, to imitate, we presume, the framing of timber building. "Spes's" drawing is unfinished, and is drawn on paper double the regulation size specified in our Club rules. His plan is rambling, expensive, and poor in arrangement. We should think any caretaker to be pitied who had to live in rooms with circular bull's-eye windows, such as those which for architectural propriety are used for the attic stage of this front.

CARPENTRY AND JOINERY.—XIX.*

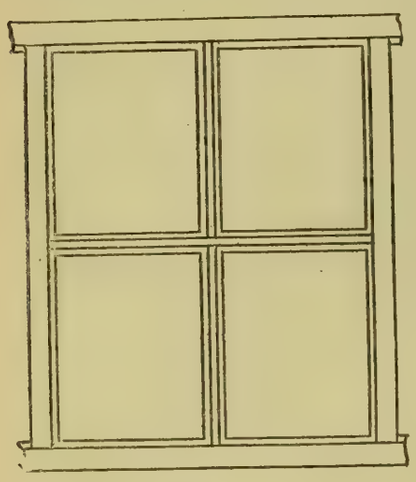
WINDOW-FRAMES AND SASHES.

WINDOW-FRAMES serve to retain the sashes, which either slide up and down in them, being balanced by weights (sash weights), or otherwise the sashes are hinged to them, when they are usually named "solid or casement frames." A very elementary kind of

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frame, and which is really sash and frame combined, is shown by Fig. 136.

The elevation is shown, and beneath sections through stiles, head and sill, also cross bars



1" Scale



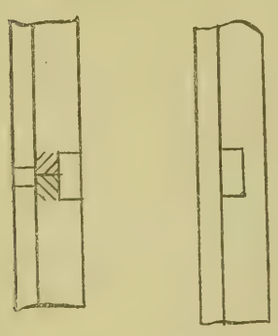
2" Scale

(inside stuff). The head, sill, and stiles may be to the same section, but can also be of different sections; and the "inside stuff" can be of the section shown. This would be for merely temporary purposes.

The easiest way to put such a frame together would be to sink the stiles in the head and sill a distance equal to the depth of the rebate or check for the glass. It is better even in elementary work like this to have a working drawing set out on a board, plan and elevation.

Then the stiles would be cut square across on both ends, and the length, of course, would be the perpendicular distance between the rebates of the head and sill; the head and sill should be long

Fig 137

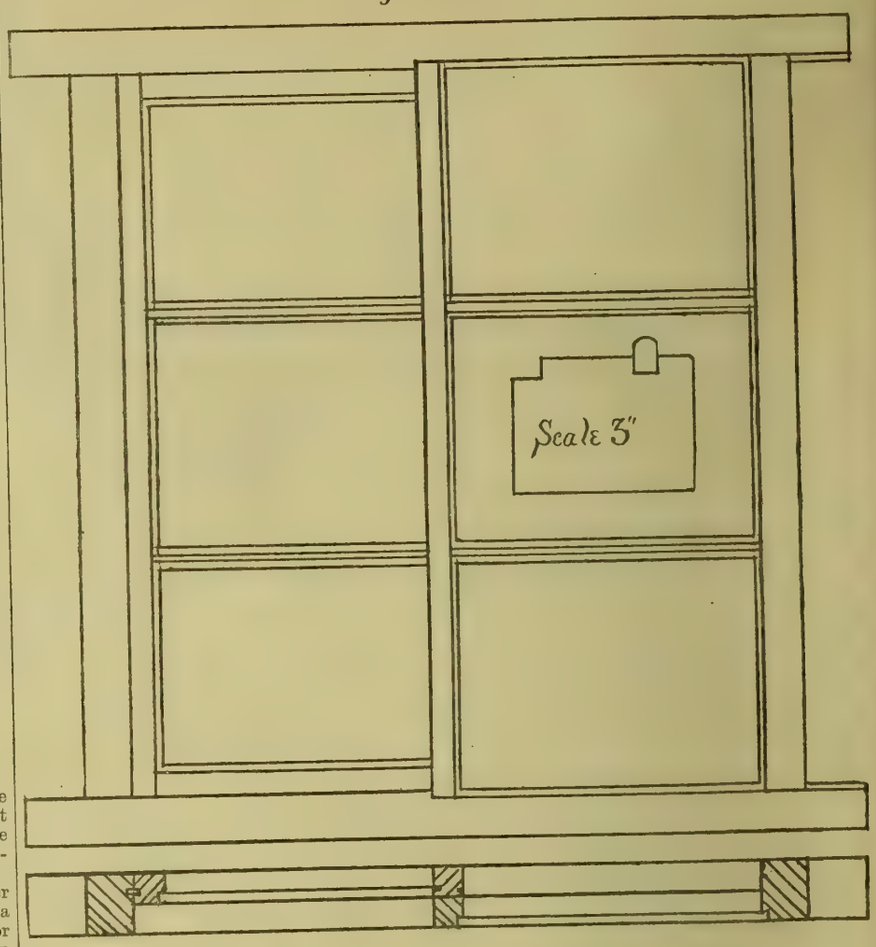


2" Scale

enough to allow of "joggles" beyond the stiles, say 4in. long, and the head and sill would be sunk to match each other, and the sinking may be either for the full thickness of the stiles or any less portion.

The least complicated method is to sink the full thickness of the stiles, the other would be similar to the putting of doorcases together, as shown in Figs. 75 and 76 of these articles. The "inside stuff" would require to be put in "mortise and tenon," and in doing so notice this: whichever way a frame or sash requires to be held together most, let the inside piece be continuous in that direction. In this case let the

Fig 139



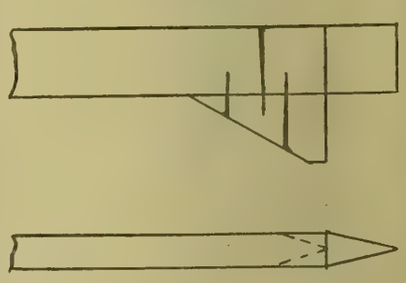
1" Scale

horizontal piece continue the full length, tenoning it into the stiles, and having a mortise in its centre for the upright bar, which, of course, is in two pieces, having tenons on both ends of each piece, the tenon on the one end which passes through the head or sill is allowed long enough to do so, and the tenon for the centre (going into the horizontal bar) is only half the thickness of the horizontal bar in length. In Fig. 137 is shown part of both cross and upright bars, the cross-bar showing the mortise, and seen on the right, and the upright bar on the left showing the meeting of the two tenons. Practically, they must not touch, as that would (unless they were accurately fitted) leave open joints at the *shoulders*.

It will be noticed in this figure that the shoulders at their junction with the bar are of unequal length. The reason of this is clear: it requires extra length to reach the rebate, so one shoulder is therefore longer than the other by exactly the depth of the rebate. This is also the case with all the shoulders of the *inside stuff*. It is well to allow a fraction on each of these inside pieces lengthwise, so that when it is cramped it will leave the sill, head, and stiles exactly straight. In cramping and wedging up this frame one matter must be well attended to—viz., the *squaring* of it: this is done with a *squaring-lath*.

Fig. 138 gives a side and edge view of this very useful article. It is made of dry, light wood (generally pine), and may be of any necessary length; it is used for squaring sashes, door-frames, and anything else which may be necessary. The squaring of the frame being treated of will be done by putting the bracket, which is nailed to the lath (and which has a sharp end to suit, shown by the dotted lines), into one of the outer corners of the frame, and marking on the lath the length to the corner diagonally opposite to it; then try the length of the other diagonal, and if it is exactly equal the frame is square; but if not, put marks at the lengths across the corners, then divide the difference between these marks, making a conspicuous or very distinct mark at the exact distance these should be across each diagonal, and to which it must be wedged and nailed. As in door-frames for external work, the shoulders and joinings should be whiteleaded or painted. Now to develop upon

Fig 138

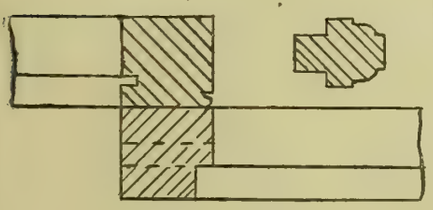


3 Scale

this very simple kind of window-frame, the "inside stuff" might be chamfered or moulded, and then at the junction of the two it would require the upright bar to be *scribed* to fit the cross-bar; it would be tenoned as at first. The shoulders would remain the same where the "inside stuff" meets the sill, head, and stiles, because they are so much wider; but the sill, head, and stiles might be moulded on their inner edges, and, if so, would require to be mitred or scribed at their

various joinings, and, of course, in doing so, the extra allowance needed would be left on the stiles. Passing on from this to what is known as a "Yorkshire light," which is a little further advanced than the above, Fig. 139 shows an elevation and plan of one, and also a section through the sill, to show the arrangement for the sliding part of the light (shown on left hand in elevation), which is simply a bead or lath with a rounded edge let into a groove, the sliding part having a corresponding groove with a hollowed bottom to fit the round of the lath; the same provision is made in the head. Now, provided there is to be no moulding to contend with (moulded sashes will be fully dealt with by-and-by), we proceed with the making, all being square, and only the rebate for the glass to contend with. The stiles are tenoned into the head and sill, as in the case of a door-frame. The stile on the left-hand would have the shoulders, *out and in*, of the same length, no rebate occurring; but that on the right hand has the outer shoulders longer by the depth of the glass rebate. The sizes of timber, as shown by the scaled figure, can be actually used. The upright piece, shown in elevation between the two stiles, is tenoned into the head and sill, and is pinned or dowelled when the *frame or light* is wedged up. The outer shoulders should be the depth of the glass rebate longer than the inner ones, and at the sill it might, with advantage, be a little longer, as the sill should be *weathered* between this upright piece and the left-hand

Fig 140



3" Scale

style from the line of the sliding sash outwards; but it need not be weathered more than the depth of the rebate for the glass. The horizontal bars are tenoned into the right-hand stile of the frame, say, 1½in., and pinned, and the tenons pass through the centre upright piece and are wedged.

The shoulders are allowed long on the outer edge of these bars to suit the glass rebate. All the working lines should be obtained from the plan and elevation set out on a board, which it should be, before getting the amount of timber required, or aught else. And now the sliding sash is made as an ordinary sash—that is, the head and sill are tenoned through the stiles (upright pieces), as also the horizontal bars—extra length should be left on the stiles (3in. or 4in.) until the sash is finished, when these *horns* are cut off. The object of this is so that, in mortising, and afterwards in wedging up, the stiles may not be split. The sill and head of the sliding sash should not have the full breadth of the sill and head of a mortise in the stiles: there should be at least ¾in. of *haunching*, as described for framed doors. There should be dowels or pins put through the stiles where the tenons of head and sill pass through, shown by heavy dots on the left-hand stile of sliding sash. It is hardly necessary to deal with the putting together and wedging up, as that is very similar to that of a door-frame, and a pretty full explanation has already been given.

Fig. 140 shows a section of the stile of the sliding sash immediately behind the central upright piece, in which upright piece by dotted lines is shown the tenon of the bar. It will be noticed that instead of a rebate in the stile of sliding-sash for glass, there is a groove; this is done to preserve the squareness of the timber for the central piece. A bead is also shown in the stile of the sliding-sash to *break joint*. The sliding-sash is fastened by screwing upon the stile (shown in Fig. 140) a small tower bolt, the keeper of which is screwed on the fast upright piece (centre), a section of which is shown in front of the other stile. Fig. 140 also shows a moulded bar, which is sometimes adopted for this style of light. As Yorkshire lights are usually only used for sculleries or cellars, no profuse work or ornamentation is displayed upon them.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—XLVI.

By Henry Lovegrove, F.S.I., Surveyor.

CEMETERY CHAPELS.

ALL TRADES.

Preliminary.

Allow for insuring the building for the full amount of the contract in an office approved by the architect, and deposit the policy with him.
Do. for providing water for the use of the works.
Do. for all risk of accident or damage from any cause; also for covering up and protecting the work from rain, &c.
Do. for carting and clearing away rubbish from time to time, and leave the building, clean, perfect, and fit for occupation.
Do. for making good damage to road or paths caused by the works.
Do. for attending upon, cutting away for, and making good after all trades in all trades.
All provisional amounts are net. p.c., and will be deducted in full or in part if not expended.

EXCAVATOR AND BRICKLAYER.

The concrete to be composed of six parts of good, hard pit or Thames ballast, and one of ground stone lime.
The mortar to be composed of one of best stone lime, and three of clean, sharp sand.
The bricks to be of the best, hard, sound, square, and well-burnt stocks. Samples to be submitted for approval.
N.B.—The earth excavated to be deposited where directed. All earth not so deposited to be carted away.

Yds.	ft.	in.			£. s. d.
99	0	0	Cube.	Dig and and cart from surface ...	
78	0	0	,,	Do. from trenches not exceeding 6ft. deep	
76	0	0	,,	Do. do. part return fill and ram	
				Allow for any baling and pumping that may be required to keep trenches free from water	
78	0	0	,,	Concrete in foundations	
Rds.	ft.	in.			
27	171	0	Sup.	Reduced stock brickwork in mortar, including all rough cutting	
	154	0	,,	Labour raking cutting to form splayed jambs	
	6	0	,,	Extra to rough relieving arch in stocks in cement	
	17	0	,,	Do. to flat axed arched in do. do.	
	48	0	,,	Do. to segmental do. do.	
	359	0	,,	Do. to Gothic pointed do. do., with splayed soffit	
	608	0	,,	Lawford's patent damp course (3d. per foot super.) and laying in walls	
	68	0	Run.	Labour, fair cut birdsmouth	
	123	0	,,	Bedding eaves gutter on brickwork, &c.	
				No. 2. Extra to rough relieving arches over chimney bars	
				No. 2. Frames bedded in lime and hair mortar, and pointed to match facings, reveals screeded	
				No. 2. Flues parged and cored	
				No. 2. Labour and materials, setting only stoves to 1ft. 9in. openings	
				No. 12. Air bricks 9in. by 3in., and setting in wall, including forming channel through wall for same	

Note.—Drains not included in contract.

WALLER.

Yds.	ft.	in.			
496	0	0	Sup.	Extra on brickwork to Kentish rag stone facings in coursed rubble, with one bonder every yard super., finished with a neat close joint in cement	
	99	0	,,	Do. do. to flat Gothic pointed arch in do.	
	108	0	Run.	Labour fair cutting in facings	
	192	0	,,	Do. do. do. circular over arches	
	209	0	,,	Rake, wedge, and point flashings in cement	

MASON.—BATH STONE.

The Bath stone to be from the Monk's Park Quarry, Corsham, Wilts, equal to sample supplied by Mr. Isaac Sumsion, 4, Newark-street, Bath
Allow for casing up all masonry to prevent damage, and remove same when required
Stone and all labour, including cramps, dowels, &c., and hoisting and setting.

9	0	Cube.	In plain ashlaring	
93	0	,,	In plain quoins	
157	0	Cube.	In sunk quoins to obtain angles	
34	0	,,	In plain band	
9	0	,,	In plain plinth	
82	0	,,	In chamfered plinth capping, including mitres and joints	
44	0	,,	In do. cornice and do. do.	
28	0	,,	In stop-chamfered head sill, &c.	
1	0	,,	In four times chamfered mullion, including dowels	
9	0	,,	In moulded weathering to buttress, worked fair one side only, the other built into wall	
43	0	,,	In moulded string	
41	0	,,	In do. buttress weathering	
50	0	,,	In sunk and moulded do.	
48	0	,,	In stopped sunk sill, with stools worked on for moulded jambs and mullions	
96	0	,,	In parapet wall, worked fair both sides	
96	0	,,	In do., raking to gables	
18	0	,,	In do., sunk at angles	
44	0	,,	In moulded jambs	
34	0	,,	In sunk and moulded arch	
97	0	,,	In sunk and moulded cornice, with paterae in same, bosted for carving level	
77	0	,,	Do. raking to gables	
83	0	,,	In sunk and moulded jambs	
26	0	,,	In do. with a part of chamfered tracery worked on	
12	0	,,	In do. in mullions and transoms, and mortises and dowels	
76	0	,,	In sunk and moulded arch stones, and a part of chamfered tracery	
30	0	,,	In tracery with mortises and dowels	
156	0	,,	In moulded arch bosted for carvings	
86	0	,,	In do. jambs do.	
17	0	,,	In sunk and moulded chimney-cap, sunk for one flue	
16	0	,,	In moulding and necking	
25	0	,,	In label moulding in short lengths	
54	0	,,	In do. circular over arches	
5	0	,,	In plain termination to do. left for carving	
114	0	Run.	Labour groove and burning in lead flashing	
42	0	,,	Stopped groove with holes for condensation	
			No. 48. Stopped ends to do.	
410	0	,,	Labour groove for lead lights and pointing	
154	0	,,	Do., do. circular	
92	0	,,	11ft. by 9ft. sunk and moulded coping, including all joints, cramps, &c., and setting in cement	
21	0	,,	Do. raking	
			No. 1. Carved and moulded finial, 2ft. 3in. by 3ft. 6in. by 9in. thick, and hoisting and fixing, including dowels	
			No. 1. Sunk and moulded apex stone to form base to finial out of 4ft. by 10in. by 2ft. 6in., and hoisting and setting cement	
			N. 2. Kneelers, out of 2ft. 3in. by 11in. by 1ft. 5in., sunk and moulded, set in cement	
			No. 208. Ends of stay bar let in and run with lead	
			No. 4. Sunk and moulded corbels, 1ft. 2in. by 1ft. 9in. by 1ft. 5in., mortised on top for wood bracket	
			No. 4. Do. do., but bosted for carver	
			No. 8. Do. do. in angles, moulded face and return, and do. (1ft. by 1ft. 9in. by 1ft 5in.)	
			Provide the sum of £25 for carving	
			Allow for use of scaffolding for carver	

YORK STONE AND SETTING.

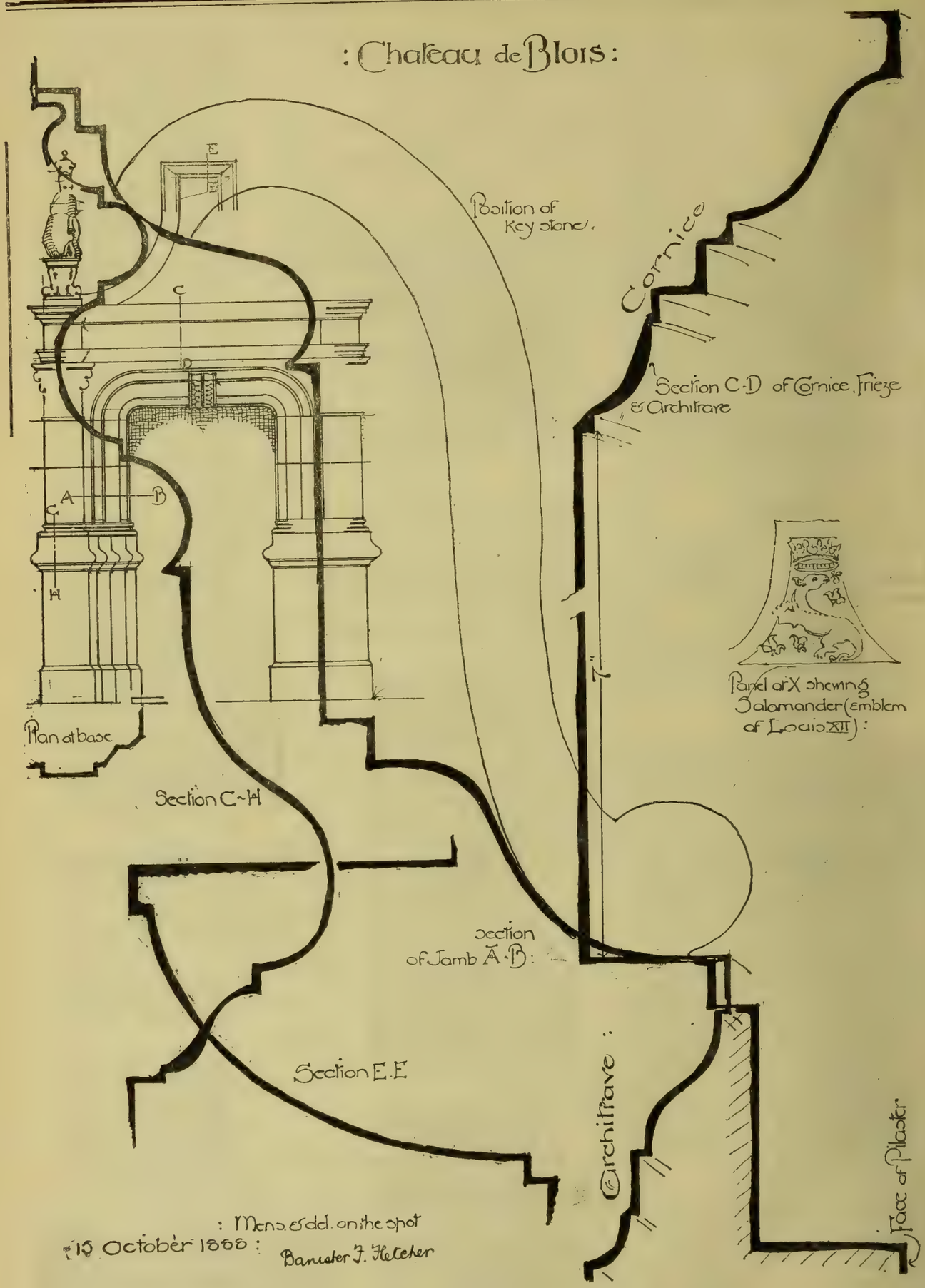
Ft.	in.			
13	0	Sup.	2in. rubbed slabs and hearths	
26	0	Run.	6in. by 4in., rubbed and rebated, curb for iron grating, including joints	
10	0	,,	10in. by 6in., rubbed and back jointed step	
			No. 4. Fair jointed ends to do.	
14	0	Run.	16in. by 6in. step as last	
			No. 4. Fair jointed splayed ends to do.	
			No. 4. 4in. tooled templates, 18in. by 9in., and building-in in cement	

Yds.	ft.	in.			
42	0	0	Sup.	Paving with 6in. granite cubes well-grouted with mortar, and forming hard level bed for same	
	28	0	Run.	18in. by 6in. tooled or axed granite sill bedded in mortar	

SLATER.

Sqs.	ft.	in.			
27	0	0	Sup.	Best blue Bangor countess slating, laid to a 3in. lap, each slate fixed with two copper nails	
	197	0	Run.	Close mitre of do. to hips	
	89	0	,,	Plain red tile ridge, bedded and jointed in cement (from Cooper's kiln, Maidenhead)	
				No 4. Red tile finials, p.c. 20s. each, and allow for carriage, profit, and fixing	
1	30	0	Sup.	Slating with small slates, and fixed with two copper nails	
	54	0	Run.	Extra to close cut mitre in do.	
				Leave roofs clean and perfect.	

The distribution of prizes in the faculties of Arts, Law, and Science at University College, London, was made by Mr. Justice Charles on Monday. The awards included the Gilchrist Engineering Scholarships—entrance scholarship, £35 per annum, for two years, P. T. J. Estler, of Woolwich; senior scholarship, £80, A. P. Head, of Newcastle-on-Tyne; and the Slade Fine Arts Scholarship, £50 per annum, F. W. Carter, of London, and Edith Vere Christie, of Blackheath; and the Slade Travelling Scholarship, £150 per annum for two years, C. Holroyd, of Leeds.



CHATEAU DE BLOIS.

THIS is one of the doorways leading on to the celebrated staircase of François I. In every ornamented portion of this staircase, from the balustrading to the caps of the columns, one meets the Salamander, the emblem of François I., and the initial letter F. A large part of the staircase has latterly been restored with a soft stone, which the architect, who happened to be visiting the château at the time, told me was called Fercé.

BANISTER F. FLETCHER, A.R.I.B.A.

WAYSIDE NOTES.

THE reforms effected by the Council of the Institute in the R.I.B.A. exam. are such as have long commended themselves to me, and such as I have often advocated. For the more an examination is split up into parts the less will be the evil of cram. It is, indeed, surprising, even considering the Institute's fame for inertness, that the step now taken has not been long ago made. An examination crowded into a short space of time, and embracing such a wide range of subjects as that required by an architect, cannot but be considered as a temporary expedient. The efficiency of the examination system as a means of educating youth increases as the square of the number of examinations. "Cram and exam." is now recognised as entirely the wrong principle to go upon, although in many high places the system is yet employed with all its debilitating consequences. By splitting up an examination into a series, students are enabled to prepare with a more certain knowledge that honest study will be rewarded, and that they will not be deprived of the benefits that may accrue from passing the exam. by any catch questions, the answering of which serves little to show the extent of their really practical work-a-day knowledge.

The institution of a preliminary exam. on general subjects is also a worthy achievement. It is no small benefit to the welfare of the profession that architects one and all should have that training which forms a part of the composition of a gentleman. Practical knowledge of one's profession cannot compensate for a deficiency in general learning. As Wightwick pointed out long ago, such learning is indispensable to the attainment of a high-class practice. I would add that it is desirable from another point of view, for the boerish, uncultivated architect does not a little injury to general interests. To his behaviour and ignorance we owe much of that sentiment on the part of the public that classifies the architect as about on the level with the builder; to him we must trace the motives that recently prompted some rural client to invite a brother knight of the T-square to partake of refreshments in the servants' hall. Manners make the man, says the proverb. Certainly they are indispensable to the architect, and without general learning manners are apt to be crude, or, to say the least, unpolished. The regeneration of the architectural profession rests to a considerable extent on the gradual improvement of its social status. I am, therefore, of the opinion that an examination that shall insure the entrance of only the cultivated Englishmen into the ranks, is of no small importance, and look upon the improvement effected by the Institute as much to be commended. Of course, without Registration there is no marked benefit to be derived from the new test of fitness. The slovenly uncared-for border lines of the profession, weak and undefended as they are, defeat any efforts of section of its members.

The first of the examinations on the new principle will be holden in November, and I advise every student to pass through the whole course of three exams., even if circumstances may allow of his passing over the preliminary. Only pupils will be able to spare the time necessary to prepare for a thorough course, but all will do well to endeavour to get their A.R.I.B.A., by passing each exam. in succession. Taken as it is intended by new, one-year-old students or under, the whole set of exams. will come as easy as possible if he has been properly educated at school or college. This, of course, is just the benefit of the thing: it enables the young architect to pursue a solid course of study where, under the one-exam. arrangement, he must resort to being crammed—stuffed, like a goose, with a mass of compounds that, after the baking or examining, is of little permanent good to any but the crammer who feeds upon it. Of course, there is the "A.R.I.B.A.," which is worth something, though it would be difficult to say how much. In the cramming system learning is superficial, and the knowledge acquired rapidly disappears, and the system is the very antithesis of that in harmony with the exhortation that urges us to "read, mark, learn, and inwardly digest."

Touching the Institute exam., I find it a very general complaint that the man who passes through with honour and credit is no more benefited than he who just scrambles through by the "skin of his teeth"; and having seen the justice of the complaint, am always ready to lend a willing ear to those who proffer it. I have indeed often thought that some distinction, over and above the Ashpitel prizeman, should be made. Otherwise there is little inducement for really hard study. On principle I object to the level and monotonous, and therefore do not see anything to admire in an examination that does not distinguish between the indifferent, the good, and the excellent, but which, merely in a machine-like manner, throws out the bad. I think that if the Institute could effect a little improvement in this way, they would find their examination more popular.

Since writing the above I see that the Architects' Registration Bill has been introduced into the House of Commons by Mr. Noble. On this occasion I do not think that the opposition of the Institute, if made, will go for much; the public will see through the motives that induce it to oppose the measure. I have never yet met with any layman who did not agree with the principle of the thing. The chief cause that led to the wreck of last year's Bill was the inclusion of the engineers, and the opposition of the Institute of Civil Engineers. The Royal Institute of British Architects has not that weight with the public which the engineering society has, and I do not fear its opposition in Parliament. It is the want of information on the part of the mass of Members of Parliament that is the most serious obstacle to be overcome in obtaining a Bill for Registration. As in the case of the general public, there must be a vast proportion of members out of the whole who will have but a vague idea of the importance of the measure. Nine out of ten ordinary individuals will express surprise that any person should be able to style himself, and practise as, an architect, and say they always had an impression that such a one must have passed some examination. This is the impression we want to rid them of, and to this end I last week proposed the circulation of explanatory pamphlets; but now that the Registration Bill has been introduced into Parliament, there is little time for doing much in this way. Every individual well-wisher of the Bill may, however, do something to render its passing more easy. I think that the most powerful aid could be rendered by that large body of A.R.I.B.A.'s who, as I have before shown, are advocates of Registration. By making some protest *against the* indifference of the *Institute within the Institute*, attention would quickly be drawn to the fact that any opposition in Parliament to a scheme of Registration on the part of the R.I.B.A is not truly expressive of the sentiments of the whole body. I have long before urged the desirability of the Associates rallying in this matter; those of them, that is to say, who are Registrationists, and who consider that the efforts of the Committee endeavouring to make the present Bill law are not quite so diabolical in purpose and intent as they have been painted in certain quarters.

I have spoken of the splitttng-up of the Institute examination as a *worthy* achievement. One is tempted to remark that it is indeed so. To think of the time that it has taken to effect a much-needed but most simple reform, and to remember the delay and procrastination it has been guilty of in the question of Registration, and the dog-in-the-manger spirit of its present proposed attitude in regard to the labours of Mr. Gough and his colleagues, leaves one with the impression that it is dead to all bold, broad actions, and alive only to petty matters. I have never ceased to regret that the Institute could not have taken in hand the questions of Examination and Registration at one and the same time. By so doing all would have gone smoothly—the difficulties inherent to a Registration Bill promoted by a younger society would have been conspicuous by their absence. Effective examination is at the root of Registration, and the two matters go hand in hand. Had the reform of the examination been worked out side by side with a Registration Bill, much subsequent alteration and modification in the former would be avoided, for, should the present Bill pass, the Institute will not be backward in assuming the position of the examining body, even if it had opposed the measure, as was contemplated, and then, if the new examination arrangements do not suit, further amendments will be required. It is a really great damage that the Institute did not take up the present Bill, or bring in one of its own for the registration of architects, for by so doing it would have done much to elevate itself in the eyes of the public, and would have re-enlisted the sympathies of the profession, at present withdrawn because of its neglect of considerations touching our general welfare.

I have been contemplating for some time past a visit to St. Alban's Abbey to enable me to see for myself the extent of the damage done to the building since I last saw it. But although there are several things in the "Sheet of Contrasts" that I have no reason to speak authoritatively upon, I should think that Mr. Steinmetz's drawing was as truthful a representation of affairs as may be obtained from sketches of the kind. At any rate, it would be as well for the contractors for the works at St. Alban's to make a detailed statement of the unjustice they complained of, and not pursue the policy that you well describe as of the "'You're another' order." I suppose it is one or two trifling details that have been drawn inaccurately. Such would not affect the question at issue, and only show that Messrs. Longmire, while straining at the gnat, are willing to swallow the camel. I do still think the drawing should be reproduced wholesale, and trust that Mr. Gough's defence fund is swelling. It would be a grand thing to rescue the building in time to save a little of the old work. I am always glad and enthusiastic at this prospect. Nevertheless, I hope that Messrs. Longmire will carefully detail the inaccuracies they complain of. It may be difficult for me to get away to St. Alban's, but if I go I shall take the drawing with me, and *should there be* any misrepresentations, will be the first to declare them. Would that the fearful abortions shown in the sketches in question were false and untrue! Unfortunately, we know them to be true, to all practical intents and purposes. And the fact remains that the old abbey, the pride and glory of Hertfordshire, and once the happy hunting-ground of London students, has been sadly abused, and is in danger of being totally ruined as regards any real antiquarian, archæological, or architectural interest.

Somebody sends me a marked copy of the *Alnwick Guardian*, in which two advertisments appear of somewhat different character; but which—so I am told—emanate from the same enterprising gentleman. Here is the first:

> TO CONTRACTORS. — Tenders are required from the various trades for the erection of a pair of villas, with stabling, coach-house, and other works, for Messrs. W. and J. Malcolm Lyon, at Wooler. Drawings, specification, and conditions of contract may be seen at the residence of Mr. Lyon, Wooler, from Tuesday, June 11th, until Monday, June 17th. Tenders to be delivered to Mr. Lyon on or before 6 p.m., June 19th, 1889. The lowest or any tender will not necessarily be accepted.
> Alnwick, June 6th, 1889. D. THOMPSON, Architect.

Here is the second:—

> Furniture and bedding warehouse. Goods of reliable quality at lowest prices at D. Thompson's, Cabinet Maker, Upholsterer, and Undertaker, Fenkle-street, Alnwick.

How convenient it must be thus to join the practice of art and construction. Our London upholsterers keep their architects on the premises, their aspiring provincial brethren play both parts themselves.

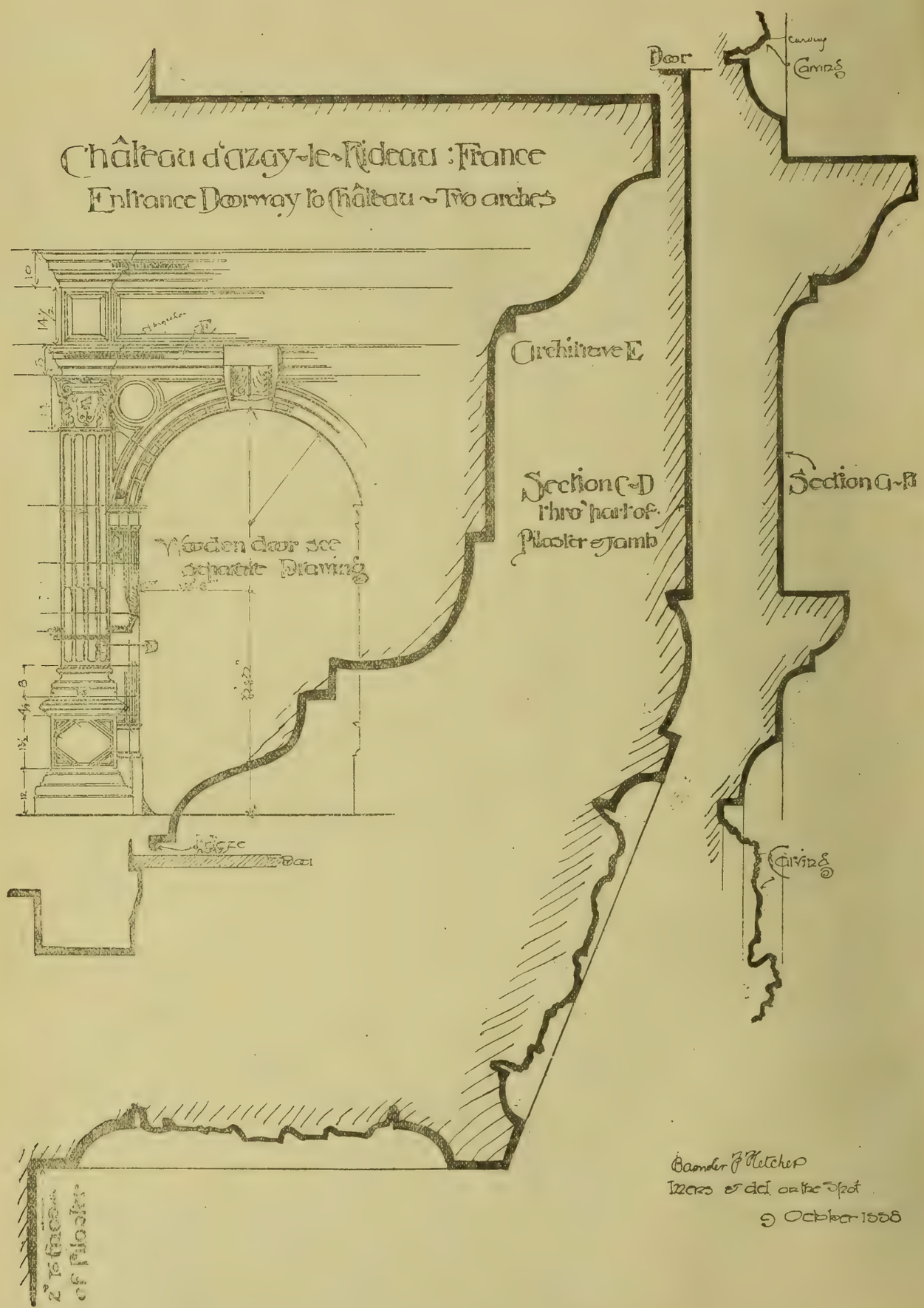
GOTH.

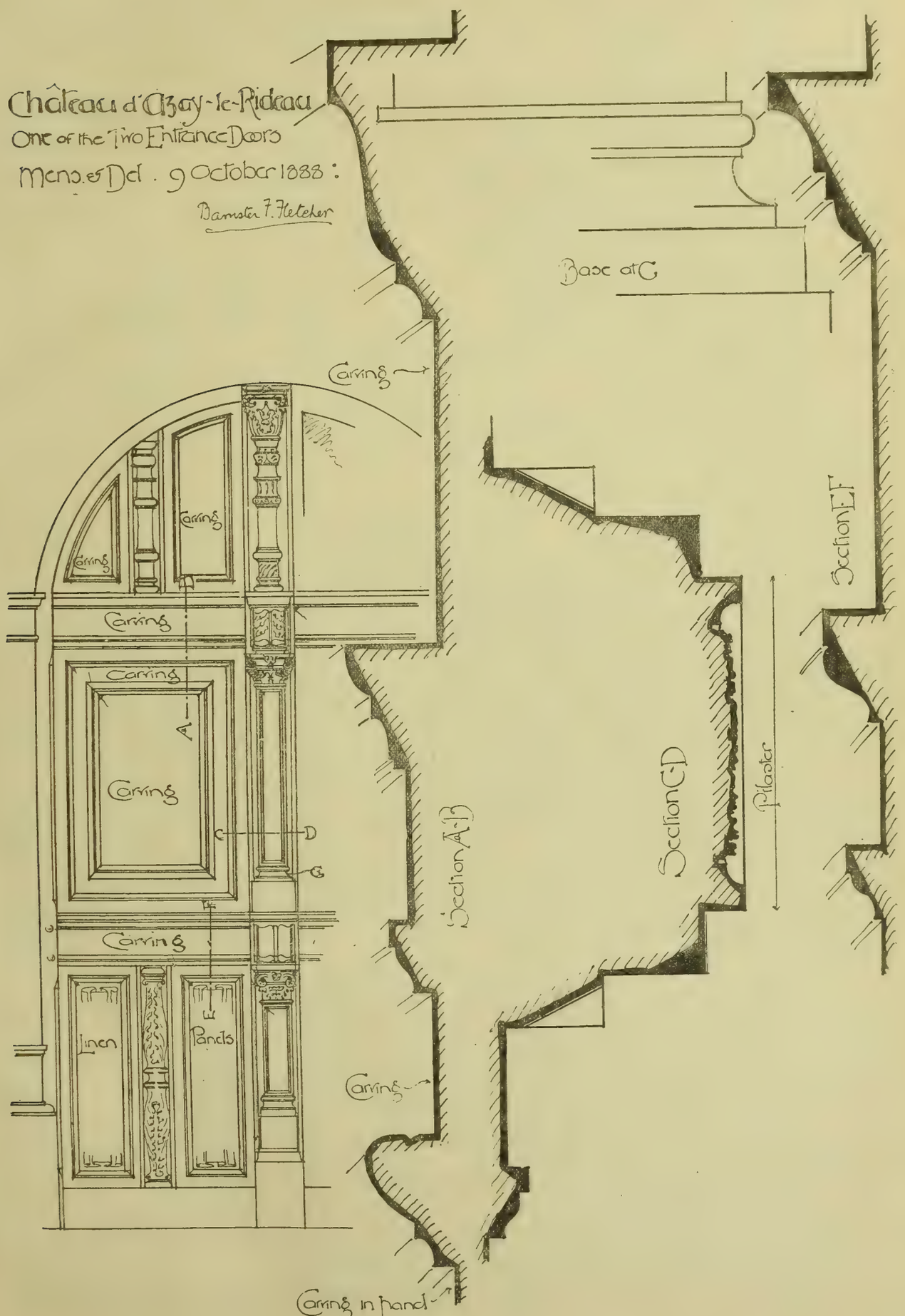
ENTRANCE, D'AZAY-LE-RIDEAU.

THE château dates from the time of François I. (1515-1547), and is occupied by the Marquis de Biencourt, who is always pleased to show one the inside, where he has many curiosities in the shape of old furniture, &c. After crossing the quondam drawbridge, one comes directly on this doorway. The dormers and finials to the angle turrets are probably the most interesting parts of the château.

BANISTER F. FLETCHER, A.R.I.B.A.

The Exeter Diocesan Architectural Society held a general meeting on the 26th, in the College hall. The report was read by the Rev. J. L. Fulford, secretary, describing works of restoration recently carried out in two or three North Devon churches: Heanton, Punchardon, and Braunton; also in the small parish church of St. Pancras, Exeter, expressing general satisfaction in what had been carried out. A paper was read by Mr. Ashworth, architect, on "Basilican and Greek Churches." An excursion was talked of to take place in August.


Château d'Azay-le-Rideau : France
Entrance Doorway to Château ~ Two arches
Door
Carving
Carving
Architrave E
Section C-D
thro' half of
Pilaster & Jamb
Section C-B
Wooden door see
separate Drawing
Sill
Carving
Carving
Boasder F Fletcher
Measd & del. on the Spot
9 October 1888


Château d'Azay-le-Rideau
One of the Two Entrance Doors
Mens. et Del. 9 October 1888:
Banister F. Fletcher
Base at G
Carving
Carving
Carving
Carving
Carving
Carving
A
B
C
D
G
E
F
Linen
Panels
Carving
Carving
Carving in panel
Section A-B
Section C-D
Pilaster
Section E-F

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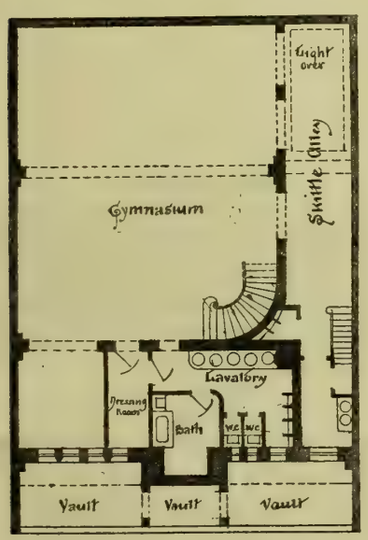
ILLUSTRATIONS.

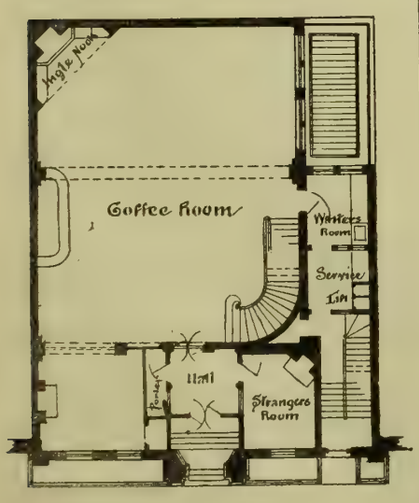
THE "PELICAN" CLUB.—WHALLEY ABBEY, LANCASHIRE.—NEW REREDOS, ST. PHILIP'S CHURCH, CHELTENHAM—DESIGNS FOR VILLAGE LIBRARY AND READING-ROOM.—FIRE STATION, WEST HARTLEPOOL.—DETAILS FROM CHATEAUX DE BLOIS AND D'AZAY-LE-RIDEAU.

OUR LITHOGRAPHIC ILLUSTRATIONS.

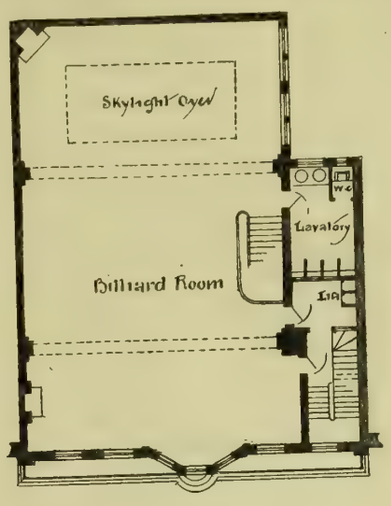
NEW "PELICAN" CLUB PREMISES, GERRARD-STREET, SHAFTESBURY-AVENUE, W.

THIS new club house, now in course of erection for Mr. A. E. Wells, the proprietor, will be

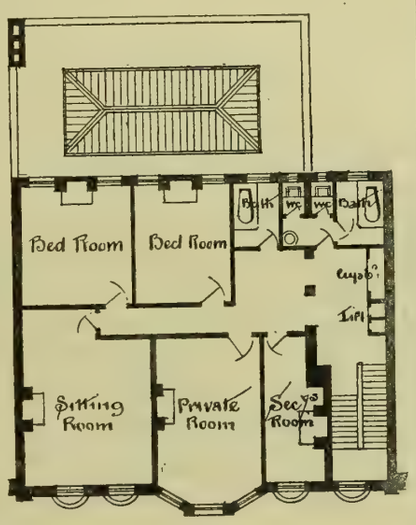




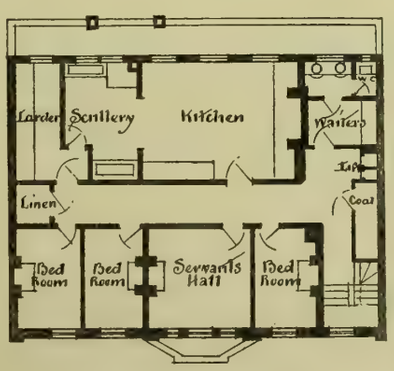
completed by the latter end of August, and is arranged, as will be seen from the plans, on an entirely novel principle, consisting practically of three large and lofty rooms, connected by a grand 5ft. staircase, which is built in the rooms themselves, and quite open. In the basement is a well-ventilated gymnasium, which will be used for boxing entertainments and other amusements,



with douche bath, lavatories, and every convenience. On the ground floor is the coffee or general club room, and on the first floor the billiard-room, which is capable of comfortably accommodating six tables. The kitchen and servants'



rooms are on the top floor, and for the rest the plans will speak for themselves. The roof is a Val de Travers flat, to be used during the summer months by the members as a smoking lounge. The elevation is of red brick and Bath



stone, and the building internally is principally of iron construction. The plans were prepared by Messrs. Martin and Purchase, architects, 11, Queen Victoria-street, E.C., and the works are being carried out under their superintendence by Messrs. Perry and Co., contractors, of Bow, E.

NEW REREDOS, ST. PHILIP'S CHURCH, CHELTENHAM.

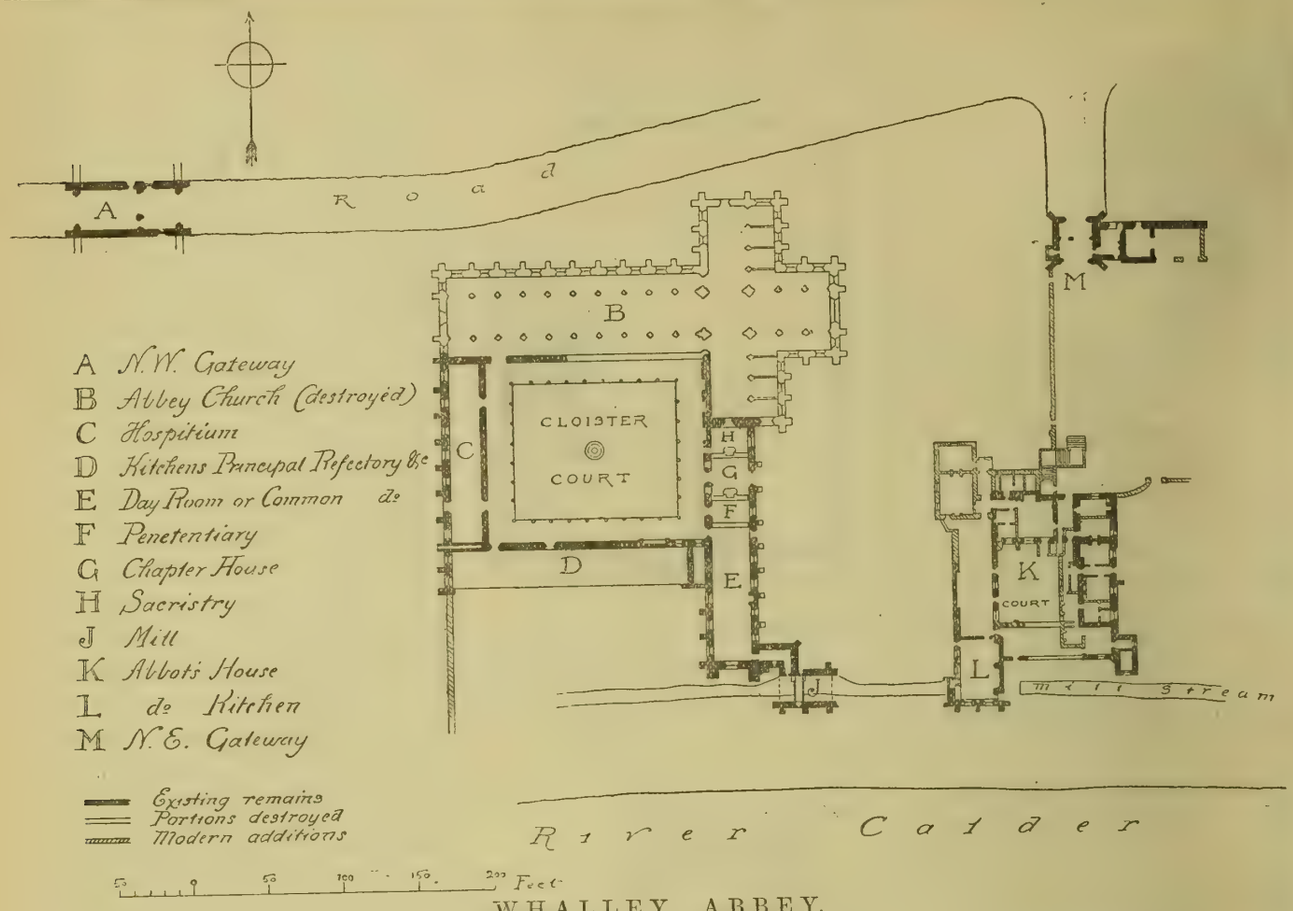
THIS new reredos is rather unusual in shape and plan, though it follows a type that abounded in England in the 15th century, and was more or less suggested by the magnificent, but sadly mutilated, example in the chantry of Bishop de Beckington, in Wells Cathedral. It consists of a back wall in three arched divisions, separated by buttresses, with projecting side walls and a roof of fan tracery surrounded by a cornice and open "brattishing." The middle division holds one large niche, the side ones having two niches each. The buttresses and ends of the lateral walls are also formed of niches to hold the smaller figures: the pedestals, strings, and other parts of it being covered with roses and other plants in high relief. The statues are altogether twenty-nine in number, and were selected so as to supplement the east window—the intention being that there should be no unnecessary repetition of the same figures. The Crucifixion of our Lord is in the middle panel, the Blessed Virgin and St. John being on either side of the cross. In two of the large niches to the right and left are SS. Philip and James, the patron saints of the church; and in the other two St. Thomas and St. Mary Magdalene. Small figures of the Archangels Michael and Gabriel stand on the two pinnacles in the middle of the side panels. The remaining twenty great men and women were chosen as representatives of various phases of life in the Church in different times and places—from the first century to our own time, and in many countries, due prominence being given to England. Evangelists (omitted in the window)—St. Luke and St. Mark. Missionaries—St. Columba and Bishop Patterson. National Saints—St. George, of England; St. Andrew, of Scotland; St. David, of Wales; and St. Patrick, of Ireland. Religious Orders—St. Francis, of Assisi. Good King—King Alfred. Statesman—Archbishop Stephen Langton. Eastern Church—St. Athanasius and St. Chrysostom. Early Martyrs—St. Sebastian and St. Agnes. The Bible—St. Jerome. Sacred poetry—St. Bernard, of Morlaise; George Herbert. Church music—St. Cecilia. Soldier—The Centurion who was present at the Crucifixion. The material used throughout is "clunch," a stone which lends itself to very delicate carving: for which it was used in the 15th century in all parts of England—at Durham, for instance, Ely, St. Alban's, and elsewhere. The whole has been executed from the architect's drawings by Mr. H. H. Martyn, of Cheltenham, and it is due to him to add that no pains were spared by him and those who worked under him to work out the design with extreme care and refinement. The reredos was designed by Mr. Henry A. Prothero, of the firm of Messrs. Middleton, Prothero, and Phillott, architects, of Cheltenham.

WEST HARTLEPOOL FIRE BRIGADE STATION.

THESE buildings are to be erected in Barnard-street, at the north-east corner of the site recently purchased by the corporation for the purposes of slaughterhouses, stables, baths, &c. They are to be faced with best pressed red Grosmont bricks, with freestone dressings. The accommodation provided is an engine-room, repairing and cleaning-room, instrument or watch room, recreation-room, drying tower, and residence for chief fireman. The estimated cost complete is £1,200. The buildings have been designed by the borough engineer and surveyor, Mr. J. W. Brown, C.E., F.G.S.

WHALLEY ABBEY, LANCASHIRE.

AFTER a railway ride of about 30 miles through the busy but unlovely manufacturing district of Bolton, Darwen, and Blackburn, the mills and chimneys are at last left behind, and as the train crosses the viaduct over the Calder valley the traveller from Manchester is surprised and delighted as he sees for the first time the ruined abbey of Whalley and its beautiful surroundings. In the year 1296 the Abbot of Stanlaw in Cheshire removed with his convent to Whalley, and commenced the erection of a new Cistercian monastery. Many of the buildings, including the gateway illustrated herewith, were consecrated in 1306. The conventual church, the foundation-stone of which was laid by Henry de Lacy, Earl of Lincoln, in 1308, was commenced in 1330 and finished about 1435. The accompanying plan, taken from Whitaker's "History of Whalley," shows the buildings both as they originally were and as they exist at the present time. The monastery flourished until the suppression of the religious houses in the reign of Henry VIII.,



WHALLEY ABBEY.

when John Paslew, the last abbot, was hanged at Whalley. The buildings then passed into the possession of laymen, and when the report prevailed in the reign of Queen Mary that she would restore them to their original owners, the church was totally destroyed. The subject of the sketches is now in ruins, and appears to have had apartments on each side. The roadway passes through it, and the gates themselves were hung in the internal arched openings. The larger opening has been widened by the cutting away of the splayed jamb and pointed arch, a segmental arch being substituted, taking the line of the original rear arch, which remains intact. The bold and simple groining which carries the floor above is in good preservation, though unprotected by a roof. The N.E. or abbot's gateway is turreted and embattled, and is of much later date; the original gates remain, and are hung in the same manner as were those of the N.W. gateway. The parish church of Whalley is a building of much earlier date than the oldest part of the abbey, and will be illustrated shortly in these pages. The chancel dates from 1220, the tower is a quaint and characteristic specimen of Lancashire work, and the interior of the church contains some canopied stalls, said to have been removed thither from the abbey. In the churchyard are three Runic crosses, believed to have been erected to commemorate the baptism in the river Calder of several thousands of pagans on their conversion to Christianity by Paulinus, Archbishop of York.

"BUILDING NEWS" DESIGNING CLUB: DESIGN FOR VILLAGE LIBRARY AND READING-ROOM.

FOR description, see p. 5.

THEY CALL IT "TIPPING" AT SPALDING.

THE members of the Spalding School Board evidently fail to fall in with the arrangements of the Educational Department. At the meeting of the Board on June 21, according to the *Lincoln, Rutland, and Stamford Mercury*, from which we copy the report verbatim:—

"Mr. Mills, architect, reported that he had had an interview with the Education Department respecting the plans for the proposed addition to the schools. They had, he said, suggested several minor alterations in his arrangements; and a discussion ensued relative to the fact that the architect to the Department, before whom the plans went, although receiving a specified salary, usually looked for a gratuity of four guineas as a means of expediting the plans—a course which, it appeared, was sanctioned by the Department. The members were unanimous in their condemnation of any system of 'tipping,' and it was decided that the money should not be paid, it being understood that Mr. Mills had come to some terms with the architect."

It is quite evident that these consultation fees are equally distasteful to architects and their clients, and it is to be hoped some other means of imparting the valuable experience of the Department's professional adviser will be hit upon.

The Society of Engineers visited, on the 27th June, some of the principal stations of the East London Waterworks Company, under the direction of their engineer, Mr. W. B. Bryan. At the Lea Bridge pumping station, in addition to the five engines already in use, the foundations for a series of three new ones are being laid to provide for the sale of the Old Ford Station to the Midland Railway. At the Walthamstow reservoirs, eight in number, with a total cubic capacity of 900 million gallons, an additional large well is in progress, and has attained to a depth of 204ft. The new pumping station at Waltham Abbey was also inspected. In the evening a number of members dined at the Holborn Restaurant, when the president (Mr. J. R. Baillie) took the chair, and the hon. sec. and treasurer (Mr. A. Williams) took the vice-chair.

Messrs. Woods and Company opened their new banking premises and manager's residence in Blyth, at the junction of Stanley-street and Bridge-street, on Monday. The building is built of red brick, with stone dressings and terracotta ornamented panels. The elevation is in the Queen Anne style, and the building has been erected from the plans and under the supervision of Mr. J. J. Lish, Past-Pres.S.A., of Newcastle-on-Tyne, and Messrs. N. and R. Reed, Newcastle, are the contractors. The building completes the line of frontage in Bridge-street, Blyth, leading from the railway station to the harbour and shipping offices.

COMPETITIONS.

ABERDEEN PUBLIC LIBRARY.—The Library Site Committee of the Aberdeen town council have adjusted the conditions for competitive designs for a building for a library on the north side of Rosemount Viaduct. The competition is restricted to architects practising in Aberdeen. The cost of the building—exclusive of internal decoration, furnishing, and architect's fees—is not to exceed the sum of £7,500.

CHIPS.

The National Portrait Gallery Bill, for making available for the purposes of the National Portrai Gallery, about to be built from Mr. Ewan Christian's plans, the piece of ground now lying vacant next to the National Gallery, and facing St. Martin's Church and Charing Cross-road, was read a second time in the House of Commons on Monday.

The Bishop of Bangor consecrated the new church of St. Deiniol, at Criccieth, on Friday. The Lord-Lieutenant of Carnarvonshire (Mr. Greaves) was the donor of the chancel and transepts, the east window, organ, and heating apparatus.

The Armourers' and Braziers' Company will hold in their hall in the City of London in March next an exhibition of modern armour and blades, and of art work in brass and other yellow metals. The object of the scheme is to encourage British craftsmen, apprentices, and designers to produce first-rate work.

On Sunday an English Calvinistic Methodist Church at Oswestry, which had been in course of erection since last September, was opened. The church, which seats 400 persons, is in the Corinthian order, and built of red bricks, with Grinshill stone dressings. Mr. E. B. Smith, Oswald-road, was the architect, and the builder Mr. Charles Edwards, of Leominster. The cost was about £1,500.

A new footbridge erected across the river Mersey, at Cheadle Heath, Stockport, was formally opened on Saturday last. It connects the districts of Cheadle and Heaton Mersey, is of iron, and was constructed by Mr. Edward Wood, of Red Bank, Manchester.

The Bristol Capitalists Association, Limited, have acquired a building estate in Bristol, lying between Hampton-road and Lovers' Walk, and known as the Alexandra Park Estate, for the erection of over one hundred villa residences.

Building Intelligence.

LIVERPOOL.—A church and wing have been added to St. Peter's Roman Catholic Church, Freshfield, Formby, and were opened on Sunday. The school has a site of 26 acres of land, six of which are occupied by buildings, kitchen garden, and recreation ground, and the rest let off to farmers. The school building was first erected for a private school, and bought for its present purpose five years ago. It has twice been enlarged at a cost of over £2,000, the chief additions comprising a refectory, dormitory, workshops, verandah, and collegiate church. The new wing includes guest rooms, which will serve, when needed, as infirmary wards, and open into a balcony, from which the patients can look the whole length of the church. The church consists of a long and lofty nave, with three side chapels on the north side, and an organ chamber on the same side. A large crucifix surmounts the tabernacle, and the altar is richly sculptured. The architect was Mr. J. O'Byrne, Liverpool, the builders being Messrs. Brown and Sons, Salford.

SUNDERLAND.—The new Church of St. Ignatius the Martyr in Suffolk-street, Sunderland, which has been given by Dr. Lightfoot, Bishop of Durham, as a thanks-offering for the blessings that he has received during his episcopate, was consecrated by his lordship on Saturday. It is the only church belonging to the Establishment dedicated to St. Ignatius in the North, and is built in a somewhat severe type of the Early English style. It consists of a nave 85ft. by 27ft. internally, and 55ft. high to the apex of the roof; aisles, 11ft. 9in. wide; a chancel 38ft. by 25ft., and 52ft. high, with a chapel 24ft. by 16ft. on the south side, an organ-chamber and vestry on the north, and a choir vestry 24ft. by 10ft. formed under the eastern part of the chancel, so as to take advantage of the slope of the ground down towards the east. At the south-west end of the south aisle is a tower, 20ft. square externally, exclusive of the massive buttresses, and forming a porch. The tower is 75ft. high, and surmounted by a broach spire of about 60ft. The nave is five bays in length, and is divided from the aisles by lofty arches, carried on quartrefoil banded piers, with moulded caps and bases, and is separated from the chancel by a lofty moulded arch. The chancel is of three bays, divided by shafts of Greenmoor stone running up to the corbels carrying the roof, and with the exception of the Greenmoor stone in the shaft and red and white Mansfield in the chancel pavement, the whole is built of Edmundbyers sandstone. All the roofs are simple in character and panelled. At the west end of the nave is an octagonal stone font, raised on two steps, with an aumbry in wall behind it. The nave and aisles are seated with low open benches, stained a deep brownish green. The chancel is seated with oak choir seats, also stained. The altar is raised nine steps above the nave, and stands in front of a constructional retable, formed by the base of a reredos, which will hereafter be erected. At present its place is taken by a high dossal of tapestry of 15th century design, with wings and side hangings of red and green. Above it, on the level of the clerestory, is a triplet of moulded lancets. On the north of the choir is a lofty arch, the lower part being closed by an oak screen, from which projects an open gallery containing the organist's seat, the organ being in a chamber in the same level. The church is lighted by iron and brass pendants in the nave and aisles, and by wrought-iron brackets in the chancel. These, as well as all the other fittings, have been specially designed. The pulpit is also of wrought iron enriched with gilding. The heating is by Grundy's hot-air apparatus. The accommodation is for rather over 700. The sole contractor has been Mr. Joseph Howe, of West Hartlepool, Mr. T. Carse being clerk of the works. The whole has been designed by Mr. C. Hodgson Fowler, F.S.A., of Durham.

Additions are proposed to be made to the Roman Catholic Chapel Star of the Sea at North Berwick, N.B. The alterations will include a new sacristy and altar, and a gallery for the choir. Mr. Basil Champneys, Strand, London, has been engaged as architect. The estimated cost of the extension is £800.

The church tower of Tevynock, Breconshire, is to be restored from plans prepared by Mr. D. Jenkins, A.R.I.B.A., M.S.A., architect, Llandebie.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., LIV., and LV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

H. B. B., Philadelphia. (The architect's name, as printed on the published view, was given in accordance with his special request).—G. H., New York. (Thanks very much. We regret the oversight in stamping).—W. AND SON, H. and B. (Plan received).

RECEIVED.—S. D.—T. G. S.—T. W. N.—C. E. and Son.—P. Bros.—L. and W.—W. and Son.—J. B.—F. K.

"BUILDING NEWS" DESIGNING CLUB.

JUDGE PITMAN. (We note your suggestion. The Coffee Tavern is the last subject this session).

DRAWINGS RECEIVED.—"Judge Pitman," "Zodiac," "D." in a Circle, "Vorwärts," "Renaissance," "Fairy," "Triangle in a Circle," "Stanley," "Ai," "Wallaby," "Abacus."

Correspondence.

BROMLEY SCHOOL-BOARD COMPETITION.

To the Editor of the BUILDING NEWS.

SIR,—If you and your readers are not too tired of the correspondence that has raged around this matter, I should like to say a few words in reply to the communication of "Fair Play," whose letter appears in this week's issue of your paper.

"Fair Play" speaks in very slighting terms of this board, in consequence of their inability to make up their minds as to what they should do in this matter. I should like to explain the position they have taken up, as it appears to me that, if a board ever desired to deal fairly by competitors, this one certainly has tried to do so.

They first bought two pieces of land, upon which they determined to build these schools; they then drafted their wishes, sent them to the official architect of the Education Department for approval, and placed him in the post of umpire or referee in the competition.

When the judgment of the umpire arrived they were willing to abide by it, although the plan recommended placed them in the awkward position of breaking a covenant entered into with the vendor that they should not erect a building more than 20ft. high beyond a certain line.

But then came out certain awkward facts showing that the design chosen by the umpire had been drawn out, and information obtained in respect thereto, so unfair that even a committee of the Institute went so far in its condemnation as to call those means "inexpedient and undesirable," which was very strong language, if we believe in the truth of the saying, that "hawks dinna peck out hawks' een."

That "ancient body," as "Fair Play" calls the Institute, are, I suppose, too old to be shocked by the politics of our competition, so they merely give a gentle grandmotherly admonition to the wrongdoer or wrongdoers, and advise them not to be such a naughty boy, or boys, again. No absolute advice was given to our unfortunate Board by this "ancient body," or "body of ancients"; but a suggestion was insinuated that for one of the schools a two-story building was perhaps expedient. The poor Board, drowning in a sea of suggestions from unofficial sources, catch at this straw to save themselves by, and now they find that we competitors are not satisfied. We most ungratefully grumble at being asked to make another set of plans for half the reward we were at first led to expect (one school instead of two), and we ask our poor puzzled Board to go out with a lantern and find one honest and unbiased architect who will adjudge fairly by the plans first submitted, leaving out, of course, the naughty boy who was so "inexpedient and undesirable," and this last suggestion the Board appear to be willing to try and carry out. And yet "Fair Play" is not satisfied with the Bromley School Board!—I am, &c.

FREDK. ROGERS.

THE MANGLING OF ST. ALBAN'S.

SIR,—If the Church of England cannot take care of its churches, it is time the nation of England took care of its monuments. Because some modern Triplet, luckier than Charles Reade's ridiculous Jack-of-all-trades, has made or inherited a fortune, it does not follow that he should have a cathedral for a plaything, or should pull an abbey church to pieces, "for lack of something else to hew and hack." It is time to make the facts known far and far—not by sketches merely, but by photographic prints. Lord Grimthorpe's friends may then pause a moment in their congenial occupation of attacking architects who are no longer alive to defend themselves, and may turn to belittleing the sun and abusing the camera.

If such prints require a motto, we need not look far for it. Your correspondent, "Ars" (which is perhaps a misprint for "Æs"), says there is no getting over the fact that Lord G. has spent about £60,000 on "his cathedral" in six years. In other words, a man who can afford to spend all this *must* be in the right. This is the clinching argument of the pothouse logician: "I could buy yer all up; yer can't get over that." Unfortunately, this argument only convinces the kind of people who use it. One Alexander Pope, whose works have been thought worth reading for nearly two centuries now, was so far from being convinced by it, that he wrote as follows about the rich pretenders to architectural skill:—

> "What brought Sir Visto's wealth to waste?
> Some demon whispered, 'Visto, have a Taste.'
> Heaven visits with a Taste the wealthy fool,
> And needs no rod but Ripley with a rule.
> See sportive fate, to punish awkward pride,
> Bids Bubo build, and gives him such a guide;
> A standing sermon, at each year's expense,
> That never coxcomb reached magnificence."

It only remains to add that the Ripley above named was a carpenter, whom the noble owner employed in the capacity of clerk of works, or architect's "ghost."—I am, &c.,

AGLAUS.

"RESTORATION" AT ST. ALBAN'S ABBEY.

SIR,—I was glad to see that you gave Messrs. Longmire and Co. "what for" in your note to their letter in this week's BUILDING NEWS. Of course, they are not to be blamed for supporting the noble lord who employs them. The more he spends the merrier, and it is "an ill wind that blows no one any good." But, if Mr. Gough and his anti-destruction—at St. Alban's—society or federation is to be of any use, the subscribers must be up and at it, for Lord Grimthorpe still is going on, and *the choir windows are being torn out now on the north side.* This has been done

since the St. Paul's Ecclesiological Society visited the abbey.—I am, &c., F.R.I.B.A.

SIR,—"Ars'" first letter was most aggressive—single-handed—if we accept the half-hearted interference of the contractor (Mr. W. J. Longmire). "Ars" has kept up a running fight with all comers. His assertions have found no favour, and have been marked by a recklessness that has, perhaps, no parallel in your pages. There is scarcely a single thing that he has said that has not been flatly contradicted, and his misleading statements in regard to St. Alban's Abbey have only been eclipsed by the all-round fashion in which he abuses the work of men living or dead, save, and except only, my Lord Grimthorpe.

"Ars" writes with undoubted ability, and in the columns of the *Times*, or in the pages of a comic journal, would undoubtedly be a shining light; but when speaking of Lord Grimthorpe's work at St. Alban's Abbey—an undertaking admittedly the greatest "restoration" scandal of the age, save and except only, perhaps (?), that of St. Patrick's Cathedral, Dublin—he says (June 14th): "I can fearlessly say that, outside the profession, the general opinion is that no such work has been carried out so well" as is Lord Grimthorpe's vandalism at St. Alban's, In this he simply damns himself by his own foolish utterance.

"Outside the profession," says "Ars"? Mr. Steinmetz, whose clever cartoons and protests against Lord Grimthorpe's dreadful work we have all seen; the venerable Bishop of St. Alban's, who positively refuses to preach in the ugly new pulpit in the nave, that his lordship humorously designates "Lord Grimthorpe's Rotunda"; Mr. Charles Browne, F.S.A., who seconded the vote of censure on Lord Grimthorpe at the close of the visit of the St. Paul's Ecclesiological Society to St. Alban's last May; the Rev. G. J. Chester, the Eastern explorer, who, 'tis said, prays daily that his lordship may be removed speedily from this vale of tears; Mr. Henry Hucks Gibbs, who feels so strongly in the matter that he has entered an expensive lawsuit against Lord Grimthorpe, purely for love of the ancient abbey that Lord G. is apparently doing his best to ruin—are one and all only a few of the thousands of non-professional people who deplore the present state of things at St. Alban's, and who, so far from considering "that no such extensive work has been carried out so well," are pretty firmly convinced that nothing in the world's history has been carried out so totally at defiance to all the acknowledged rules of architecture, and so grievously at variance with everything that one's natural instincts suggest to be right, as is the work Lord Grimthorpe is now doing at the poor abbey.

"Ars" falls foul of Mr. Hugh Roumieu Gough more particularly, because that gentleman, with characteristic energy, goes into the matter with a thoroughness that, it is to be hoped, will ultimately lead to Lord Grimthorpe's deposal from the Sultanship of St. Alban's Abbey. He twits Mr. Gough for praising the work on the high altar screen, for asserting that it is the one and only redeeming feature in the Abbey, and for universally condemning all that Lord G. has done.

St. Alban's Abbey is not hid under a bushel. It may be seen by all who care to visit it. Mr. Gough asserts that nothing in worse taste has been done this century than the work Lord Grimthorpe has supervised the execution of at St. Alban's, and that probably nothing better is to be found anywhere in this country than that which Mr. Henry Hucks Gibbs, acting under the advice of his architect, Sir Arthur Blomfield, has done upon the high altar screen in the same building. "Ars" denies this, and as actions speak louder than words, you, Sir (June 7), published some samples of Lord G.'s work, and in this current week's number give the world photographic reproductions of three of Mr. Harry Hems's statues, that "Ars" (May 17th) referred to in these words: "I have just had another long look at the statues, which certainly seem as if they were figures painted on the flat." In this latter remark, "Ars" shows that he himself is an undoubted "flat" when he comes to art criticism!

No doubt "Ars" thinks he is toadying very prettily to Lord Grimthorpe when he abuses the work that Abbot Wallingford designed, and Mr. Gibbs has restored. But, although Lord Grimthorpe can fight his own cause without "Ars's" very questionable interference, the latter makes a mistake in supposing that the work upon the screen in question does not win Lord G.'s approval. Lord Grimthorpe has expressed his unqualified admiration of the manner in which the screen is being restored. It is a libel on Lord Grimthorpe to say that, because he cannot do it, he cannot appreciate good work when he sees it.

In one of his letters "Ars" takes the credit to himself for having shut up the best part of his opponents; but, the real fact probably is that the majority of writers decline to have anything further to say to so unfair and untruthful a correspondent.

Speaking of veracity, all that "Ars" says about the late Mr. Chapple is manifestly untrue; and if one went into detail, every hair of "Ars's" unfortunate head could be picked out. In one of his letters he reasserted that Mr. Chapple paid out of his (Mr. C.'s) own pocket for certain work done. The actual facts are these:—The cost of the arcading restored by the ladies of Herts was £200: that sum was paid to Mr. Chapple for one bay of it, as may be seen by the Abbey accounts. Further, he is wholly wrong as to the arcading on the southern side, for Mr. Chapple paid for the work on the eastern part, by order, and on account, of Mr. Gibbs. Mr. Chapple paid for the work on the south side, and the whole of the money was repaid him in two cheques—one for £250, and one for £115 7s. 6d.

This is only mentioned as examples of how utterly unreliable a correspondent the person is who signs himself "Ars."

"Ars" is very anxious that the world shall know and be duly impressed that Lord Grimthorpe has spent £60,000 upon the Abbey. He may have fooled away double that amount, for aught the public knows; but, like Mr. Benzon, the "Jubilee Plunger," he has precious little that is worth anything to show for such an outlay. As I have already hinted, "Ars" will do his ideal, Lord G., the best service by saying no more.

Meanwhile the work of mutilation goes on apace in the choir of the poor abbey. Nothing so saddening, nothing so uncalled-for, nothing so unjustifiable has taken place there as is the present destruction of the exquisite old choir windows, and the substitution in their place of *totally different modern windows.*

Can "Ars" inform your readers why it was that Lord Grimthorpe's men put all sorts of impediments in the way of St. Paul's Ecclesiological Society's members seeing all the abbey during their late visit? Is it true that Mr. Longmire, the contractor, fastened up the gateway by Romeland himself just before the visitors came around, and thus prevented most of them from inspecting the deplorable and disgraceful condition of the old Norman slype door that, denuded of nearly all its priceless 12th-century wrought ironwork—metalwork absolutely unique—now lies amongst a lot of rubbish on the north side?

When the nave was reopened some few years ago, a luncheon was eaten afterwards by those concerned at the Peahen Hotel. The writer happened to be present. The company were most of them clergymen, for there was also a goodly sprinkling of the laity; but, so far as one recollects, not a single architect was present. After the lunch a joke was passed quietly around, and seemed to find universal favour. It ran, that as Lord Grimthorpe had done a good work, the sooner he was called to receive his Heavenly reward so much the better it would be for the abbey and all concerned!

This is a fact. What does "Ars" think of it, in contradiction to his recent statement that everyone outside the profession (of architecture) viewed Lord G.'s work with favour?—I am, &c.,

A. S. S.

IMPROVEMENTS IN THE CONSTRUCTION OF WINDOW-SASHES.

SIR,—In the forty years' experience in London, principally as builder's foreman, I have frequently seen the inconvenience and danger, not to mention the actual accidents arising from the clumsy construction of our window-sashes when cleaning, reglazing, or painting are required. I quite agree with Mr. George Fuller that, of the vast number of special arrangements which have been at our Annual Building Exhibitions, none have been taken up practically to any extent, nor do they appear likely to commend themselves for universal adoption.

I quite agree with him that expense in the first place stands in the way; but I cannot see that his suggestion of three sashes instead of two is likely to remedy this. There are many grave objections to this suggestion, one of which would be the projection from the face of the plastering in all cases where the frames are fixed in 9in. brickwork. Quite true, the sashes would not individually be so heavy when divided into three instead of two, but experience will show that a long sash will run more easily than a short one; consequently the three-sash system would be a great disadvantage in this respect, and in all probability more trouble and vexation.

It has long been my opinion that the remedy for the grievance would be an invention which could be applied to existing sashes at trifling cost without interfering with their structural arrangement.

I have been favoured with a view of, and examined, such an arrangement, not in a model, but applied to a pair of sashes 6ft. 6in. by 4ft. It consists of certain fittings being applied, by means of which each sash is turned inside out below the sill inside, and can be cleaned, painted, or reglazed without the aid of steps. The whole affair is very simple, and as nearly automatic as possible. The sashes can be turned and replaced in their original position in less than one minute. The inventor has, I am informed, obtained provisional protection for his invention.—I am, &c.,

Wimbledon, July 1. W. GRIFFITHS.

CHIPS.

Archbishop Smith, of Edinburgh, laid on Saturday the foundation-stone of additions to the Catholic Schools of St. John in York-lane, Edinburgh. The plans of the additions and alterations, which will make accommodation for several hundred extra children, were prepared by Mr. John Biggar, 26, Frederick-street, Edinburgh. They show a plain structure, with high roofs, large windows, and covered and uncovered playgrounds. The cost of the work, which has been intrusted to Messrs. M'Lean and M'Lennan, West Crosscauseway, Edinburgh, is estimated at over £1,400.

Mr. Gilbert, A.R.A., has been invited by the Father Damien Memorial Committee to prepare estimates and designs for a statue of Father Damien at Kalawao, to cost not less than £500.

The committee of the Lichfield Church Extension Society have made the following grants:—Handsworth (Hamstead), St. Paul, for new church, £300; Hednesford (Rawnsley), temporary church, £50; Perry Parr, renewal of grant of £24; Longton, St. John, increase, £150; Newchapel (Brindley Ford), temporary church, £100; Barlaston, additional grant of £21.

An elevated site has been obtained at Barmouth for a new church which is to seat 1,000 persons. Mrs. Dyson Perrins will defray the cost of the chancel, tower, side chapel, and vestries, as a memorial to her late husband.

A Select Committee of the House of Commons has rejected the Worcester and Broom (Extension to Aylesbury) Bill, the object of which was to effect a junction with the Metropolitan Railway Company's extension from Rickmansworth to Aylesbury, now in course of construction. The Committee, however, passed the Towcester and Buckingham Railway Bill, a competing measure.

The dissolution of partnership is announced of P. Dalton, F. W. Smithers, and E. Tegetmeier, of Upper Gloucester-place, Dorset-square, trading under the style of J. L. Bacon and Co., heating and ventilating engineers.

The committee of the British School at Athens offer a studentship of the value of £50 for one year, tenable at the school. The studentship is open to all members of the University. Candidates should apply as early as possible by letter to Mr. H. F. Pelham, M.A., Exeter College, Oxford, from whom all particulars may be learnt.

The foundation-stones of a new Conservative Club, which is to be erected at a cost of about £2,000, were laid at Newchurch, near Manchester, on Saturday afternoon by Lord Charles Beresford, M.P., and Mrs. Robert Mitchell. Mr. P. D. Lodge, of Manchester, is the architect of the club.

A prehistoric tomb of Laconia, at the village of Vaphion, near Sparta, has just been opened, and is found to resemble those of Mycenæ. It consists of a long corridor leading to an inner chamber, and in the latter have already been found two gold vases figured in relief, one of silver, several of bronze, two gold rings, a score of incised stones, with many fragments of silver vessels.

Last month at Tumble Llannon a mission church called St. Lullen was opened, and also on the 30th a Congregational chapel called Bethesda was opened. The architect was Mr. D. Jenkins, A.R.I.B.A., M.S.A., Llandebie, and the contractor Mr. Rees, Peregrine Crosshands, Llanelly.

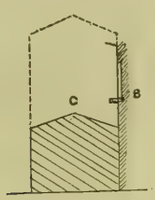
Intercommunication.

QUESTIONS.

[10023.]—**Sketching Block.**—Could any of your readers inform me how to make a solid sketching block of Whatman's handmade paper, size 15½in. by 10½in.? I tried and put together 20 sheets, had the edges cut with a machine and damped them, and lined up the edges with gum paper on a cardboard back and put under the press. Result:—The surface of block wavy and sides sprung.—A PUPIL.

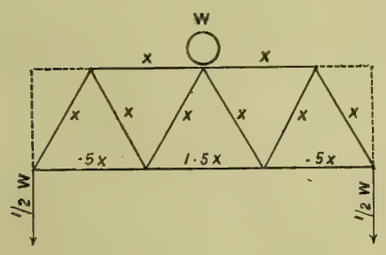
[10024.]—**Commission on Restoration after Fire.**—Being called in by proprietor to assess the damage caused by fire to buildings, and having completed same, submitted estimates, attended with insurance agents, and completed all work in connection therewith, will someone inform me what commission I am entitled to on £4,000, the worked being carried out by the proprietor.—WOBLY.

[10025.]—**Right of Light.**—Would any of your readers kindly inform me if I shall be allowed to carry my building, C, higher than my neighbour's window, B,

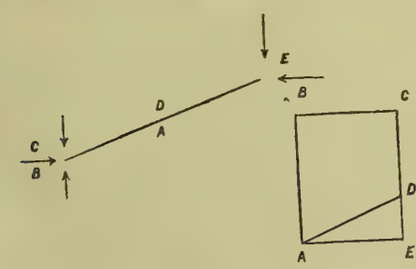


which has been built up for more than 20 years, and how shall I do with the projecting sill and cornice?—H. T.

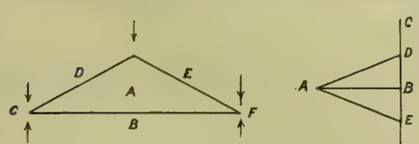
[10026.]—**Warren Girder.**—Will any of your readers explain the following diagram of a Warren girder from Adams' book on Strains?—How is ·5 x and 1·5 x obtained?



(x=strain on centre bars). In applying the parallelogram of forces, when the parallel lines have been drawn, how



can it be ascertained whether the member is in tension or compression? There is nothing to indicate which it is. On plate 7 are the diagrams representing a rafter and its



reciprocal diagram: how are the lengths of the lines obtained in the latter, and also in the last two sketches herewith?—IN THE DARK.

[10027.]—**Reverberation.**—Can some reader suggest a remedy for reverberation in a church? Someone has suggested that the roof should be draped; but this would be undesirable. Cannot a sounding-board over the pulpit be employed? What shape is best for a public room in which to hear well? I have always considered a plain rectangular room objectionable from an acoustic point of view, and a church of the old square type is certainly bad for sound, and causes reverberation.—AUDITORIUM.

[10028.]—**Old Brickwork.**—I should like a few names of places near London where examples of ornamental brickwork can be seen. Any old houses with moulded or cut brickwork that can be sketched will be of service to—ENQUIRER.

[10029.]—**Kitchener.**—Can anyone practically acquainted with the construction and setting of close ranges give any instructions as to the mode of setting and cleaning them.—B. S.

REPLIES.

[9975.]—**Water in Cellar.**—In reply to "Hydropath," I should say his composition was not laid on a dry surface. That would cause the blow-holes. If he lines his cellar with tarpaulin, making the joints thoroughly watertight, then laying his bricks in the composition, draining any water that may accumulate under the tarpaulin into one corner, I should say it would keep the cellar quite dry. In building the side walls, not more than two courses should be built at a time.—D. W. G., South Africa.

[10016.]—**Hengrave Hall.**—Your "Twenty-Three Years' Purchaser," as he calls himself, cannot be a very attentive reader, or he would have known that both a plan and view of Hengrave Hall, with some details, were given in the BUILDING NEWS for Dec. 4, 1885, accompanied by a long description. He will also find that a view of the entrance was published in the BUILDING NEWS for Aug. 15, 1884, when the visit of the Architectural Association was described at length, with several particulars of this Suffolk home of the Gages. He will find both these references well worth looking up.—A READER SINCE THE FLOOD.

[10020.]—**Damp Cement Floors.**—Address your complaint to Claridge's Patent Asphalte Company (Limited). No doubt, due to a land spring.—J. T.

[10020.]—**Damp Cement Floors.**—The water must be owing to condensation. Ventilate the room and put in a drain.—G.

CHIPS.

Designs for the "Fra Paolo Sarpi" monument, which is about to be erected in Venice, were recently exposed for public inspection in the palace of Mr. Browning, on the Grand Canal. About thirty were exhibited, and of these that of the artist, Sig. Marsilli, has been selected by the Municipality. Towards the cost of its erection the committee have in hand about 36,000 francs (£1,440), and the total expenditure will not far exceed this sum. The Council has also granted a free site for the monument in the Campo Santa Fosca, near the ruined church of the Servi, and the monastery in which Fra Paolo Sarpi spent most of his life and wrote many of his most celebrated works. What is now being done is carrying out a decree of the Venetian Republic passed shortly after Fra Paolo Sarpi's death in 1623.

A large picture by Jacopo Chimenti Empoli, representing "St. Zenobia Restoring a Dead Child to Life," has just been presented to the National Gallery by Mr. George Salting; it is numbered 1282, and is hung in the first room. It is the first example in the gallery of the work of Chimenti, who flourished between 1554 and 1640. The chief figures are the saint wearing a richly-embroidered robe and a mitre, the kneeling mother and her dead child, and in the background are many spectators.

A villa is about to be built at Burry Port, for Mr. John Bevan, superintendent of the Bengal Baragunda Copper Co., Limited, Giridih, Bengal, India. The architect is Mr. D. Jenkins, A.R.I.B.A., M.S.A., Llandebie.

It is stated that the Dean of Rochester (Dr. Hole) desires to see the tower of Rochester Cathedral again surmounted by a spire, and that with a view to raising the necessary funds he contemplates a lecturing tour in America, the subject of his oratory being "Charles Dickens and his Writings." The old pyramidal leaded spire was removed nearly seventy years ago, and the upper part of the central tower was then rebuilt under the direction of Cottingham.

The newly-reconstructed pier at Worthing was opened on Monday by Viscount Hampden. The pier has been so enlarged and improved as to make it practically a new structure. The head is now 105ft. wide and 140ft. long. A pavilion, or concert-hall, seating between 600 and 700 persons, has been erected, and other improvements have been made. The work has involved an outlay of £12,000, of which £2,200 has been spent in the erection of the concert-hall. Mr. Chappell, of Brighton, was the contractor, and the whole of the ornamental zinc-work was executed by Messrs. Holden and Co., of Wood-street, Westminster, at four weeks' notice.

The Burns-Tannahill Committee in Paisley have agreed to invite offers from a limited number of Edinburgh and Glasgow sculptors for a bronze statue of Robert Burns, to be erected in Paisley at a cost of about £1,200.

The Bill promoted by the London County Council as to the inspection of theatres and music halls, provides for the annual inspection of such buildings by the Council, and for the granting of certificates. A penalty of £50 is suggested in the case of structural alterations being made without the consent of the Council, and the Bill will further empower the Council to make regulations with reference to ingress, egress, seating, lighting, &c.

A mission church is about to be built at Cymmer—diocese of Llandaff. Messrs. Halliday and Anderson, of Cardiff, are the architects.

The members of St. Paul's Ecclesiological Society paid a day visit to Norwich on Saturday last, under the guidance of Dr. Bensley.

LEGAL INTELLIGENCE.

"REASONABLY FIT FOR HUMAN HABITATION."—WALKER AND WIFE v. HOBBS AND CO.—This action, heard in the Court of Queen's Bench on Tuesday, before Lord Coleridge and Mr. Justice Mathew, was the first which has arisen upon the Working Classes Dwellings Act of 1885, section 12, which enacts that "in any contract for letting, for habitation by persons of the working classes, a house or part of a house, there shall be implied a condition that the house is in all respects reasonably fit for human habitation." The defendants are builders, and have built a number of dwelling-houses in different parts of London, and, among others, in Bermondsey. In November, 1887, the plaintiffs took three rooms in the Central Block. About that time the plastering of the ceiling had fallen down, and was, no doubt, not in a proper condition. After that, on Christmas Day, 1887, there was a second fall of the plaster, and two guests were injured. Finally, in July last year, when the family were sitting in the room, the plaster fell down again, and struck the wife on the head, and inflicted on her injuries. On that the plaintiff brought an action, and put his case on three grounds—(1) breach of actual warranty that the ceiling was sound; (2) wrongfully leaving the ceiling in an unsafe state; (3) on the enactment in the statute. The first two grounds, however, failed, and the case rested on the Act. It was urged on the part of the defendants that it was not sufficient to support the action; but the County Court Judge thought otherwise, and left the case to the jury, who found for the plaintiffs, damages £50, for which he gave judgment. This was an appeal by the defendants against that judgment. Mr. Clavell Salter, on their behalf, urged that the word "condition" in the enactment did not give a right of action to the tenant, but only a defence against an action by the landlord, and, further, that it was confined to sanitary defects—bad drains and the like—a view, however, which the Court said would give no effect to the enactment, and no real relief to the tenants. Counsel on the other side was not called upon. Lord Coleridge said, in giving judgment, that it would be irrational to give to the word "condition" the narrow construction contended for by the counsel for the landlord. The object was to secure that the dwellings of the working classes should be reasonably commodious. The Act said, in effect, that it must be taken that the tenant took the house on the terms that it should reasonably be fit for him to live in; and whether it was so or not was a question for the jury, to whom the County Court Judge left it, so he was right, and the verdict must stand. Mr. Justice Mathew concurred. Judgment upheld, and appeal dismissed.

WHAT IS A "CONTRACT UNDER SEAL"?—GUARDIANS OF DARTFORD UNION v. TRICKETT AND SONS.—Court of Appeal, June 30 (before the Master of the Rolls, Lord Justice Lindley, and Lord Justice Bowen).—In November, 1887, the plaintiffs advertised for tenders for the supply of Guernsey granite spalls, and the defendants sent in a tender. This tender was accepted, subject to a contract. The plaintiffs sent on a formal contract, and the defendants inserted the words "weather and other circumstances permitting," and signed the document, returning it to the plaintiffs on November 18, and saying that they would put the work in hand so as to have it completed in the specified time. On November 22 the clerk to the plaintiffs wrote to the defendants, stating that he had struck out the words "and other circumstances," and adding that the defendants were right in putting the matter in hand. The defendants sent no answer to this letter, and on November 26 the plaintiffs affixed their seal to the document. Delay occurred in delivering the granite, owing partly to the weather and partly to the absence of shipping at Guernsey, and the plaintiffs brought this action to recover damages for breach of the contract. The defence was that there was no contract under the seal of the plaintiffs to which the defendants assented, the defendants contending that the only contract to which they assented was a contract with the words "weather and other circumstances permitting," which contract had never been sealed. The plaintiffs' contention was that the defendants, under the circumstances, must be taken to have assented to the contract with the words "and other circumstances" struck out. Mr. Baron Pollock gave judgment for the plaintiffs for £47 10s. agreed damages. The defendants appealed. The court now dismissed the appeal. The Master of the Rolls said that, assuming first that there must be a contract when the seal of the guardians was affixed, he had no doubt that the defendants in their own minds assented to the alteration made by the plaintiffs on November 22. The subsequent correspondence might be looked at to see whether or not there had been an assent. That assent must be communicated to the other party. If one party so behaved himself that the other party assumed, and had a right to assume, that the first had assented, it was a true inference to draw that the first had assented, and the case was the same as if there had been an actual communication in words. From the

defendants' conduct in not answering the latter of November 22 any jury would find an assent and a right in the plaintiffs to assume such assent. There was, therefore, a binding contract when the plaintiffs affixed their seal on November 26. In the second place, speaking for himself, he could not agree with the contention that the seal of the guardians must be affixed to the document after it became a contract. If any ordinary person made an offer with his signature attached, in a case where signature was necessary to support the contract, and that offer was accepted by the other side, it was clear that the signature then became the signature to the contract. If a corporation, where its assent to a contract must be under its seal, made an offer under seal, and that offer was assented to, it would be unreasonable to say that the same rule should not apply as in the case of an ordinary individual, and that the acceptance of that offer was not binding on the corporation. Therefore, on both grounds, whether there was a binding contract on November 26 or subsequently, he was of opinion that the plaintiffs were entitled to judgment. Lord Justice Lindley concurred. All the facts showed that on November 26 the defendants had assented to the contract as altered by the plaintiffs, and the contract was then complete. With reference to the other proposition, that a corporation could not make an offer under seal for acceptance so as to be bound by it when accepted, that was to him an entirely novel and astounding proposition, to which he could not assent. Lord Justice Bowen said that it was clear to him, from the correspondence and conduct of the defendants, that the defendants assented to the alterations made by the plaintiffs on November 22. It was also clear that the plaintiffs thought the defendants had assented. Assent of the mind was not sufficient unless that assent was communicated to the other party. Communication need not be in writing or in words. Conduct might amount to a communication. The circumstances here showed that the plaintiffs thought, and had a right from the defendants' conduct to think, that the defendants had assented. The plaintiffs were right in so assuming. The ground upon which he rested his judgment was that there was a complete contract on November 26, when the plaintiffs' seal was affixed.

PARLIAMENTARY NOTES.

ARCHITECTS' REGISTRATION BILL.—In the House of Commons on Tuesday night, Mr. Wilson Noble, member for Hastings, and Mr. George W. Hastings, member for East Worcestershire, obtained leave to introduce the Architects' Registration Bill, and it was read a first time. The measure was backed by the Right Hon. Sir Lyon Playfair, K.C.B. (South Leeds); Major-General W. T. Goldsworthy (Hammersmith), and Mr. Justin Macarthy (Londonderry).

St. Paul's Church, Truro, was reopened on Friday, after enlargement by the erection of a new nave and north aisle, and the erection of an organ, by Messrs. Hele and Co., of Plymouth. The new nave is seated with pitch-pine benches set on Nightingale's yellow deal blocks, with concrete foundations. Mr. John D. Sedding, of London, was the architect; Mr. John Farley, of Truro, the builder; and Mr. Thomas Polkinghorne the clerk of works. The outlay has been about £1,900.

Memorial stones of Methodist New Connexion school-church at Cheslyn Hay, near Cannock, were laid last week. The building is Italian in style, and the materials employed are brick, with Penkridge stone dressings. Mr. W. Wood, of Longton, Staffs, was the architect, and Mr. S. Wootton, of Bloxwich, the contractor. The cost will be about £1,700.

The Worcestershire County Council have appointed Mr. G. Fennel, at present assistant surveyor to the Bromsyard highway board, as third assistant county road surveyor. The salary of the appointment, for which 20 candidates offered themselves, is £150 per annum, with the stipulation that no pension or superannuation shall be payable.

An interesting memorial to the Rev. C. H. Ford, who was for thirty years vicar of St. Peter's, Bishopton, has just been unveiled. It consists of a reredos of Caen stone. The main portion is divided into three bays by triple pilasters in red Devon and Irish green marble, having carved pediments and floral capitals. The arches are trefoliated, the super arches being pointed and ornamented with crockets and gablets. In the centre bay is an alabaster cross, while the other bays have the sacred monograms entwined within quatrefoils. The structure includes wings, which are divided into three architraves by red Devonshire marble pilasters, above which there is a border of foliage. The work was executed by Jones and Willis, of Birmingham and London.

A parish room to accommodate 300 is in course of erection at Maesteg, diocese of Llandaff, from the designs of Messrs. Halliday and Anderson, of Cardiff.

Our Office Table.

IF the current report be accurate that a committee of the London County Council have recommended the appointment of Mr. Joseph Gordon, M.Inst.C.E., borough engineer and surveyor to the Leicester Corporation, as engineer to the County Council, both that body and Mr. Gordon are to be heartily congratulated. Mr. Gordon, although only fifty-two years of age, has already had a long and distinguished career as an engineer, and has had a wide range of experience, which will fit him for the onerous duties which it is believed he will be called on to discharge in the Metropolis. Articled to the borough surveyor of Carlisle, he took part in the execution of the sewerage of that city, under Mr. (now Sir) Robert Rawlinson, and after some experience at Tynemouth, was appointed, in 1858, by Mr. Rawlinson, resident engineer of the sewage works at West Ham. From 1860 to 1866 Mr. Gordon was city surveyor of Carlisle, resigning that appointment to become acting engineer for the sewerage of Frankfort-on-the-Maine—a post which, seven years later, he exchanged for that of consulting engineer, a step which gave him greater freedom to practise. During the twenty years ending 1880 Mr. Gordon carried out, in whole or in part, sewerage schemes for Munich (population 230,000), Stuttgardt, Nuremberg, and many smaller towns in Germany and Austria, and drainage and waterworks in Dusseldorf, Linz, &c. In 1880, having refused the position of engineer of Bucharest, owing to the conditions of residence attached to the offer, Mr. Gordon returned to England, and in November of that year was appointed borough surveyor of Leicester. Since taking up that appointment, he has nearly completed, as engineer-in-chief, the works in progress for the prevention of flooding in low-lying districts, at a cost of £260,000, and has prepared a scheme, now in course of execution, for re-sewering the town, at an ultimate cost of a quarter of a million, this embodying the laying out of the sewage-farm of 1,375 acres—the largest in England, and only exceeded by those of Berlin and Paris. In 1887-88 he served as President of the Association of Municipal and Sanitary Engineers and Surveyors—a body in which he has, from its formation, taken an active interest. Mr. Gordon's present salary at Leicester is £1,000 per annum; that offered by the London County Council is £1,500.

THE Marquis of Bute has granted the use of the Drill-hall at Cardiff for the Eleventh Annual Ecclesiastical Art Exhibition to be held during the Church Congress. The leading church and school furnishers throughout the country have already signified their intention of exhibiting, and as Cardiff is a rising town, offering many new fields to exhibitors, it is expected that the trade department of the exhibition will be larger than ever, while the greatest pains are being taken to secure a large and interesting loan collection, to which all churchmen are invited to contribute. The exhibits will embrace every object used in the building and adornment of churches—goldsmiths' and silversmiths' work, ancient and modern and ecclesiastical metalwork in general, tapestry, embroidery, wood and ivory carving, church furniture, paintings, drawings, architectural designs, &c. The offices of the exhibition have been removed to new and larger premises, Maltravers House, 17 and 18, Arundel-street, Strand, W.C.

EXTRAORDINARY prices were realised at the sale of M. Secretan's pictures on Monday and Tuesday. The works were chiefly reproductions of the Old Dutch Masters and of French artists of the period between 1830 and 1860. Millet's "Angelus" was secured for the French Government by M. Proust for £22,125, after spirited competition with two American dealers, one of whom, it was said, represented the U.S. Government, who wished to acquire the work for Washington. The other pictures, as a rule, fetched more than they had cost M. Secretan, with one glaring exception—Forting's "Fantasia Arabe," the price of which fell from £3,200 to £980. The chief purchasers were Frenchmen, Americans, and Belgians, not a single important picture being knocked down to an English bidder.

MR. WALTER DE GREY BIRCH, F.S.A., of the British Museum, has just published in autotype facsimile the Anglo-Saxon Charter of King Edward the Confessor to the Abbey of St. Mary, at Coventry, founded by Leofric Earl of Mercia in 1043, for the reception of an abbot and twenty-four monks of the Order of St. Benedict, found by him some two years since. By the discovery Mr. Birch was able to add another evidence of the ancient English tongue to his work "Cartularium Saxonicum," or collection of charters relating to the Anglo-Saxon period. The document was purchased for the trustees of the British Museum, and is now to be seen in the collections there in capital preservation. It is upon a single sheet of parchment, 9½in. high by 6½in. wide, in twenty-three lines of very neat caligraphy, the ink used being of a dark yellowish tint, whilst the precise and sharp upright-shaped Anglo-Saxon characters testify to the capability and care of the scribe.

THE second examination held by the Company of Carpenters took place on the 24th, 25th, 26th, and 27th ult. The following are the successful candidates. First-class certificate:—C. W. D. Boxall, gold medal; H. Kent, silver medal; A. Whittier, bronze medal; G. Evans, A. D. Johnson, J. D. McNaire, G. W. Chilvers, A. G. Morrice, C. T. Aston. Second-class certificate:—W. Benn and J. Hunt.

CHIPS.

Messrs. Bailey Denton, Son, and North have been instructed to prepare a scheme of sewage disposal for the Berkshire County Lunatic Asylum at Moulsford.

Mr. G. L. Till, son of the city surveyor of Birmingham, has invented and registered a sandbox for use on tramways. Its immediate application, however, is proposed for the cable-tram lines in that city. The box is fixed underneath the roof steps of the car, close by the side of the driver, who, by pressing a lever with his foot, opens a valve inside, and thus allows the sand to flow down two pipes fixed directly over the metals.

An inquiry was held at Newtown, Mont., on the 26th ult., before Mr. S. J. Smith, an inspector from the Local Government Board, with reference to an application from the Newtown Local Board for sanction to borrow £2,000 for paving the principal streets of the town. It was explained that the plans had been prepared by Mr. Dudley, C.E., and would be carried out under the direction of Mr. J. Owen, surveyor to the board.

The erection of a new Roman Catholic church has just been commenced on the Rose and Crown Estate at Watford. Messrs. Turner and Co., of Watford, are the builders.

The township commissioners of Bilston have applied to the Local Government Board for permission to borrow £2,000 for works of water supply, and have consulted Mr. Baldwin Latham, of London, as their engineer.

On Saturday the foundation stones of a new church school at Parkfield, Middleton, Manchester, were laid. The school will be erected from designs prepared by Mr. A. Banks, of Oldham. The plans show a large room 65ft. by 30ft., and two classrooms 23ft. by 18ft. each. The cost will be £1,800.

New offices are being built for the Wakefield Gas Company at a cost of £2,000, and last week the foundation-stone was laid with some ceremony. Messrs. Flower Brothers were the contractors for the brick and stone work, and the tender of Mr. Charles Squires, also of Wakefield, has been accepted for joinery and carpentry work.

The foundation-stone of the Sidney memorial fountain at Stafford was laid on Thursday, the 27th ult. The fountain is being built of Hopton Wood stone. The contractors are Mr. E. J. Benton and Mr. T. Herbert.

On Thursday the foundation-stones of a new Wesleyan Sunday-school at Bucknall, near Hanley, were laid. Mr. J. Leonard is the builder, and the architect is Mr. Elijah Jones, of Hanley.

The Baptist Church, South Lambeth-road, was opened last Sunday, having been closed for repairs and decorations. The whole of the windows have been filled with leaded lights of various geometrical designs, which has been entrusted to Messrs. Jones and Firmin, 120, Blackfriars-road, S.E.

The town council of Crewe have decided to consult Mr. Baldwin Latham, C.E., on the disposal of the sewage of the borough, the cost of his report not to exceed one hundred guineas.

St. John's Church, Longton, built 125 years since, was reopened on Sunday week after the construction of a ritual chancel, and improvements to the seats and roof. Mr. C. Lynam, of Stoke-on-Trent, was the architect, and Messrs. Tomlinson and Betteley were the contractors.

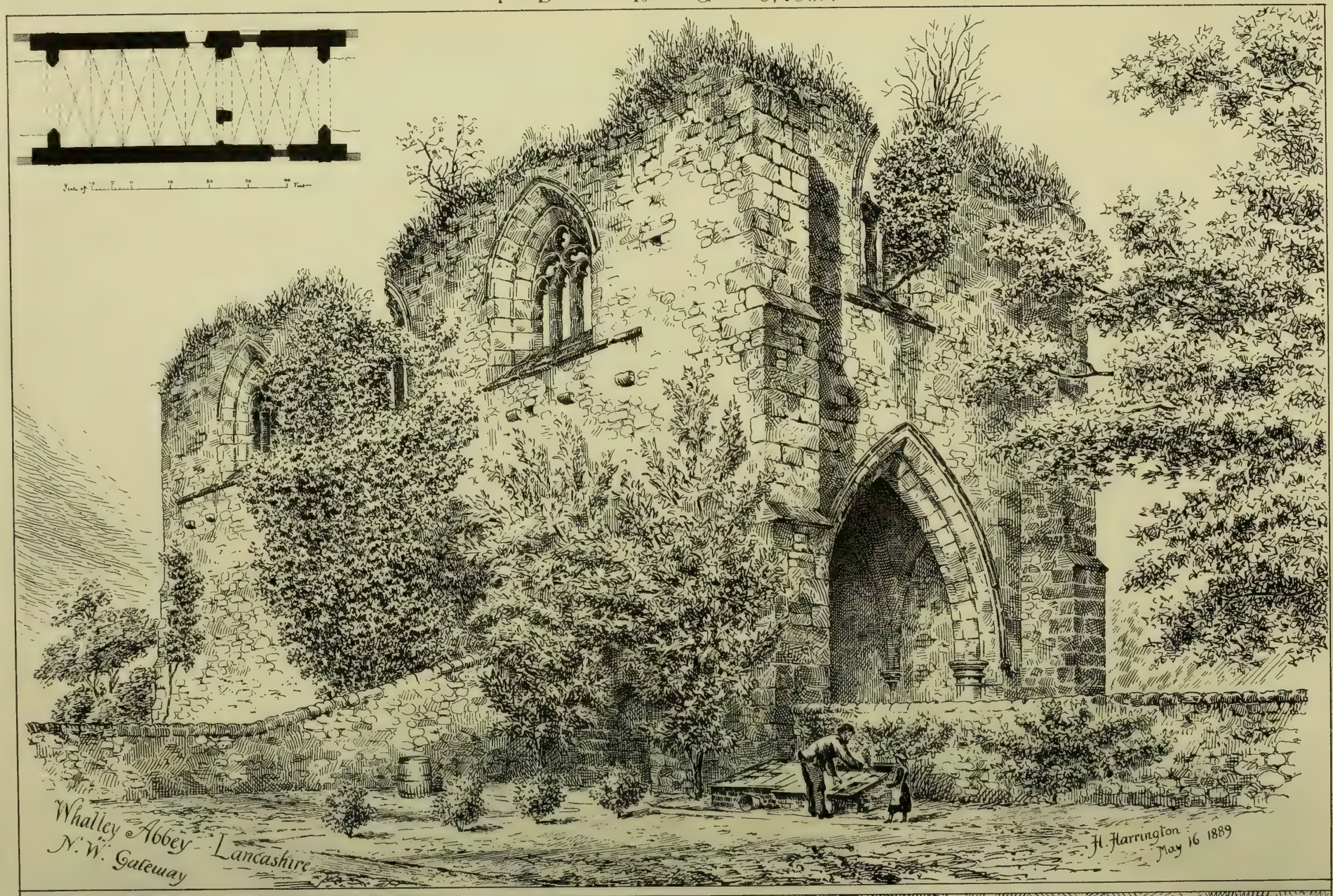

Whalley Abbey Lancashire
N. W. Gateway
H. Harrington
May 16 1889



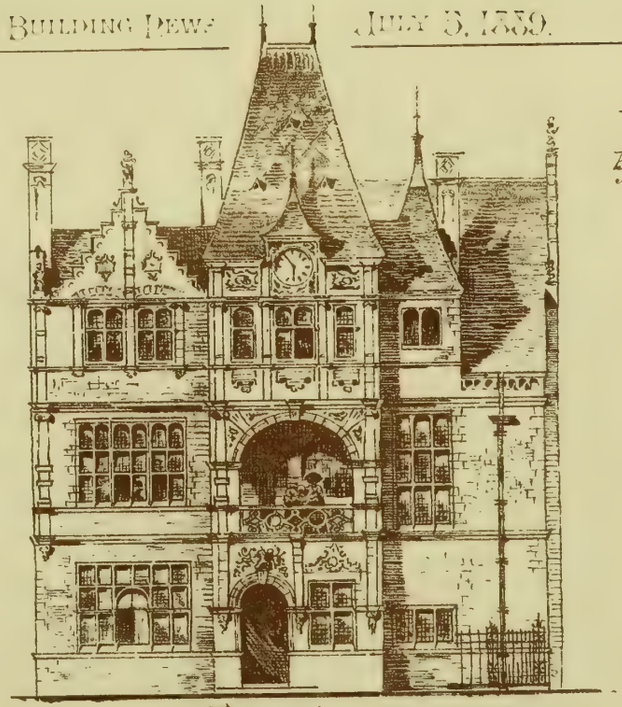
Photo-Lithographed at the Ordnance Survey Office Ackerman 6 Queen Square W

B: D: D: C:

A Village Library & Reading Room



Alternative Upper Storey



Elevation

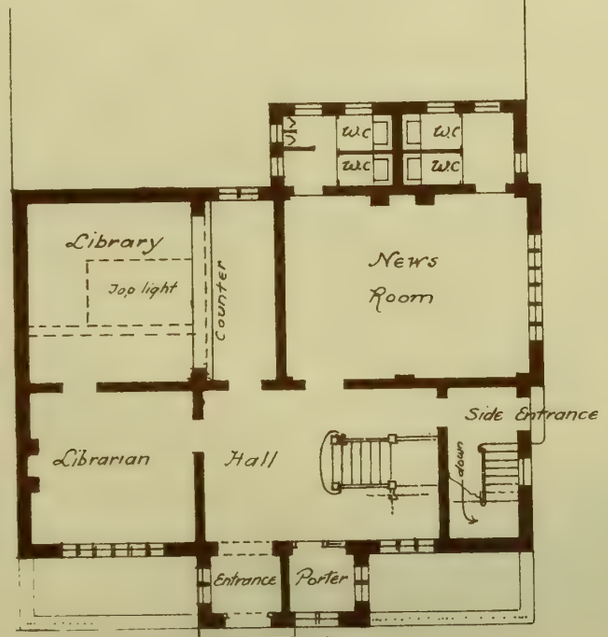
0 5 10 20 30 40 feet

by "Neb"

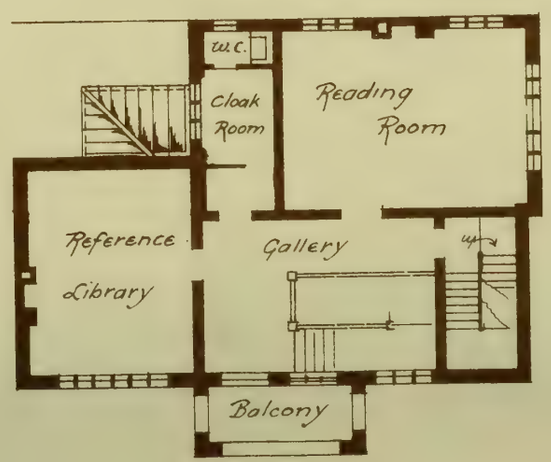
PLACED SECOND



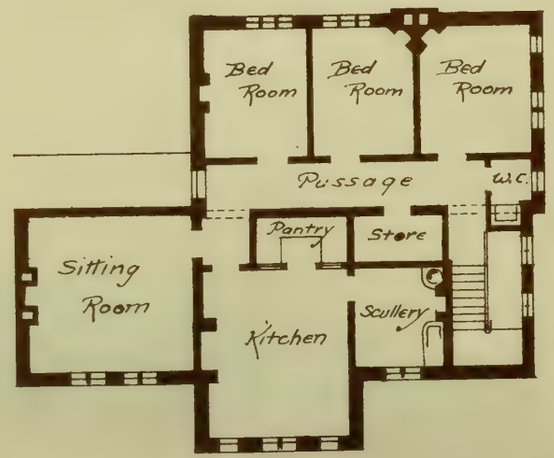
Sketch



Ground Floor



First Floor



Top Floor

May 1889

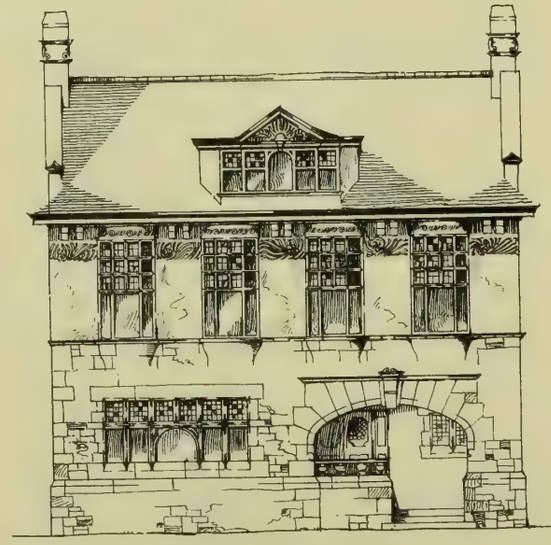
Photo-Lithographed & Printed by James Akerman, 6, Queen Square W.C.

B.N.D.G. A Village Library

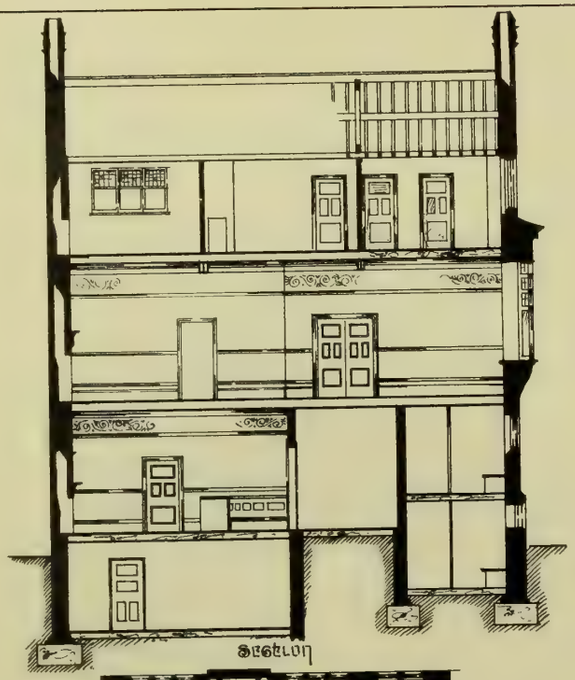
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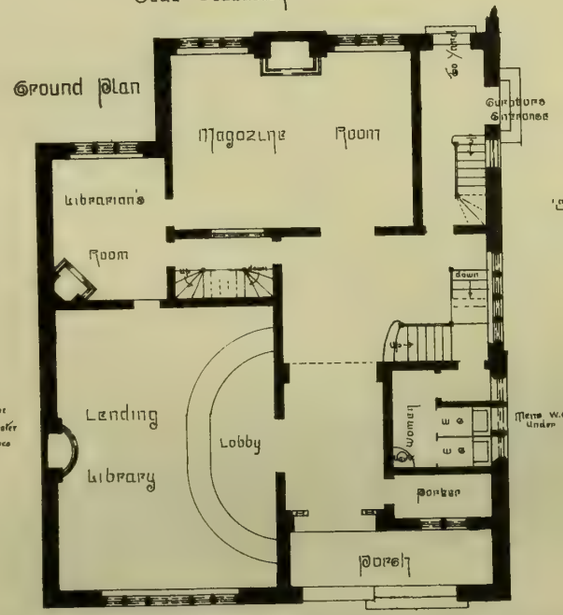
Side Elevation

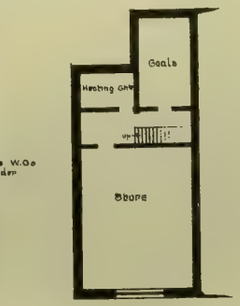


Front Elevation



Section





Basement Plan

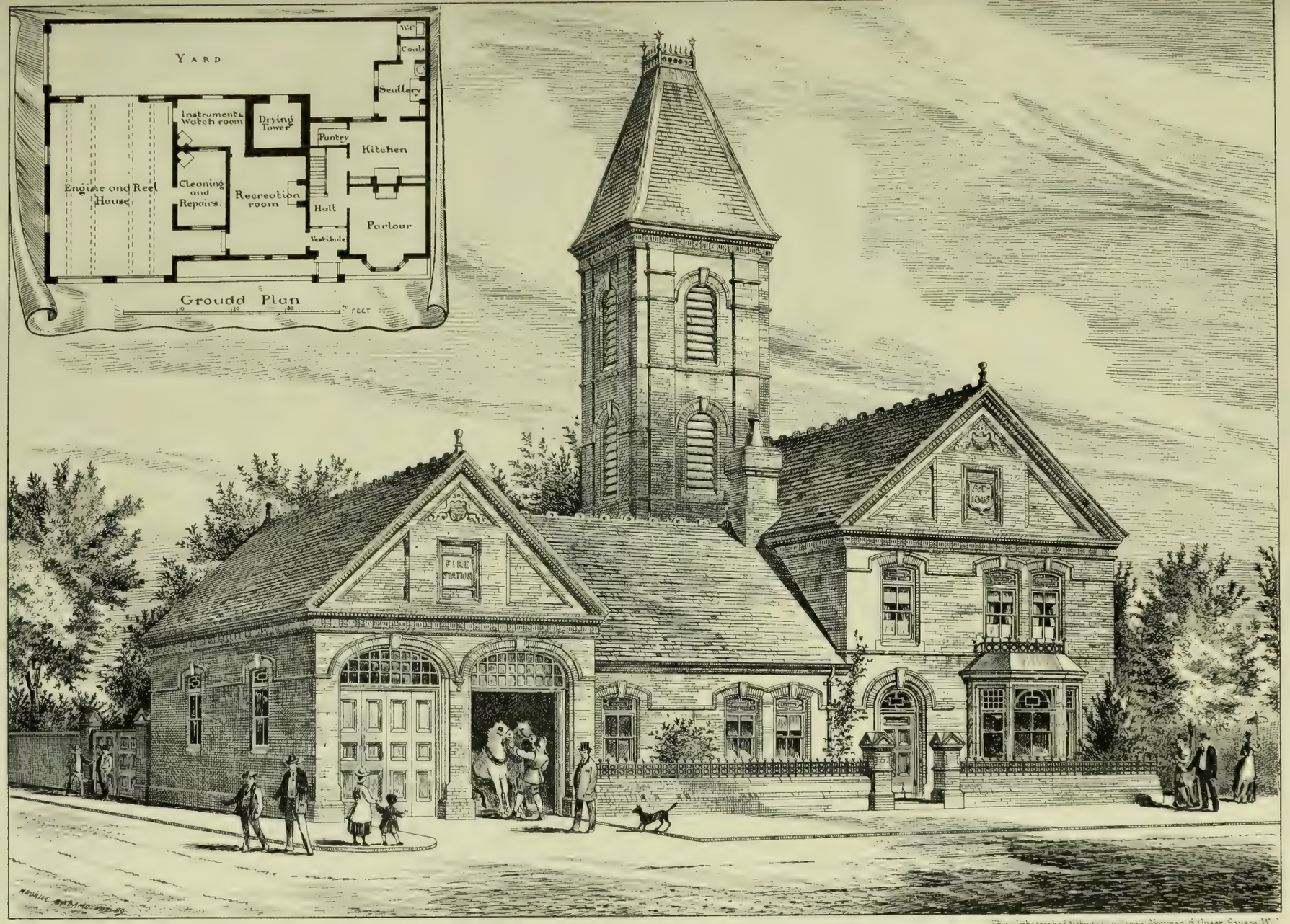


Second Floor Plan



First Floor Plan

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FIRE STATION BOROUGH OF WEST HARTLEPOOL

J.W.BROWN C.E, F.G.S, BOROUGH ENGINEER

Photo Lithographed & Printed by James Akerman 6 Queen Square W.C.



"PHOTO-TINT," by James Akerman 6 Queen Square London W.C.

THE PELICAN CLUB, SHAFTESBURY AVENUE.


NEW REREDOS S. PHILIP'S CHURCH CHELTENHAM.
MIDDLETON, PROTHERO & PHILLOTT, ARCHTS H.H. MARTYN, SCULPTOR, CHELTENHAM

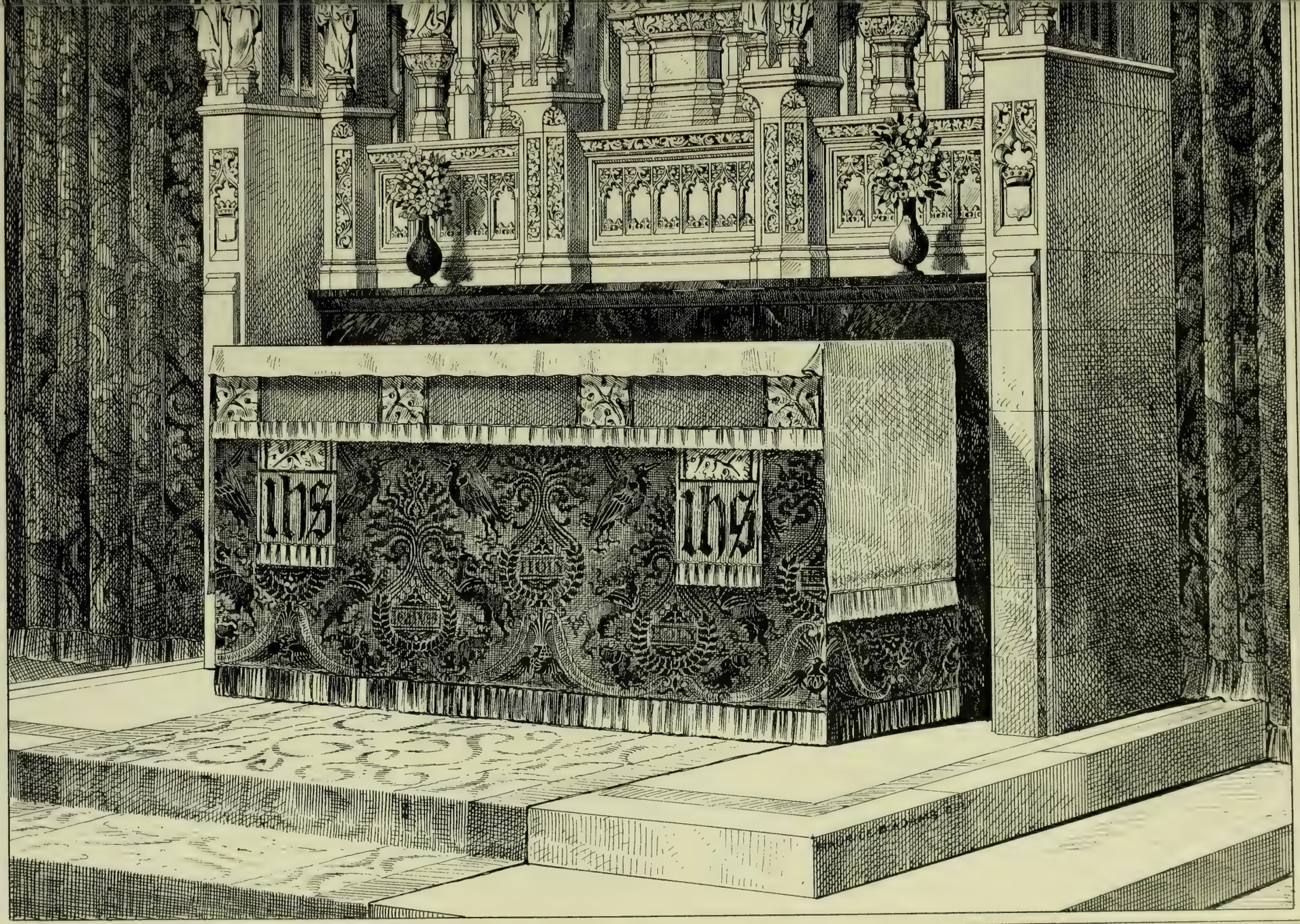


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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1801.

FRIDAY, JULY 12, 1889.

WORK FOR THE HOLIDAYS.

THE hard-worked architect needs a holiday that shall at least not put him in mind of his daily round of labour. To some professional men the thought of going sketching and measuring old buildings is distasteful: they want to divest their minds entirely of architecture and its surroundings; to fling away for a short time at least all that pertains to buildings and measurements, and to enter into a new sphere of thought and feeling that shall make them forget their offices. Business men find this hard to do: habit has become second nature to them, and with many the change of scene is only endurable for a brief period; after which they begin to hanker after their office life and professional duties. They like to see new buildings and talk of architecture and business. And this speedy return to old habits of mind and body is only consonant with what we know of human nature, and the tendency of the mind to revert to subjects which have exercised it so long, and which have a fascination for it. The relaxation gives a keener appetite for work, thought becomes stimulated, and the taxed brain is quickly on the look-out for new problems. It is a pity, perhaps, such minds cannot completely forget their work for a few weeks in their tour abroad or their stay in some Alpine region.

There is another class who feel the greatest enjoyment in combining art and relaxation, pleasure with business. To the true artist seeing is a continual feast: it is not like trade or commercial work, which wearies. The young architect or student goes away with a feeling of unmingled pleasure in the thought of exchanging for the nonce office routine for a ramble into a rich architectural district where he can examine and sketch and bring home a fund of information. He has not yet felt the absorbing cares of a large lucrative practice, or any of those little worries arising out of public business which banish art and sympathy with nature. So far he is fortunate in the enjoyment of his aspirations. To those, then, who go for profit or to unite business with pleasure, a few suggestions occur to us. The practitioner absorbed in public or private work, the architect or engineer who holds one or more appointments as surveyor to corporations, local boards, or improvement commissioners, may derive much useful information by a short stay in a new country or district. We cannot help noticing the local prejudices entertained by surveyors who have not been far afield: how they use methods and adopt practices that have only local predilection in their favour. Of course, this "localism" of practice and custom is less than it was: the Local Government Board's rules and by-laws, and the annual conferences of engineers and surveyors, especially the discussions at the meetings of the Association of Municipal and Sanitary Engineers and Surveyors, have done much to diffuse general information and to disabuse the mind of narrow local prejudices. Take, for example, that much-controverted subject sewage disposal, or utilisation of refuse. How much can be learned by personally inspecting the treatment as carried out by other towns similarly situated, and obtaining particulars of the working and results of processes. The published statistics which find their way into the hands of the surveyor are generally from interested persons, reports printed and circulated by the companies; but it is not easy to obtain the real facts and results without inquiry made personally. The materials used, the construction, the plan and design, the fittings and apparatus can only be learned in an hour's inspection and inquiry. A few spare hours of the time usually spent without result in visiting other localities, may be profitably devoted to the subject of the working of the by-laws relating to building, especially tenements. How much area is allowed in the rear of houses, how much frontage space, the construction of party-walls, rules as to walls, and so forth, are questions that can be learned best by visits to the towns themselves, so that the clearest evidence may be obtained of the effects and operations of the statutes. Other important matters that can only be learned by inspection and examination are road-construction and maintenance, the laying-down of pavements, sewerage, dust disposal, and other items of municipal administration.

In the larger fields of architectural lithology and construction much can be gleaned. We have repeated questions being put respecting local modes of wall building, the effect of certain building stones, the economical means of working the same, their durability and colour. Those who have never made their acquaintance with the building stones of Derbyshire or Yorkshire, for example, as seen in actual buildings, can have but a faint idea of the proper employment or distribution of the coloured sandstones—red, and brown, and grey—the mode of working adopted in the locality. Masonry and architectural stonework cannot, in fact, be learned properly without a sojourn in stone districts, like Yorkshire, where the great towns afford examples of working the Carboniferous series of sandstones of the millstone grit and coal measures. Scotland affords a fine ground for the study of architectural masonry, and the buildings of Glasgow and Edinburgh are as necessary to be known as the brick districts of the South and East. The architect can only become acquainted properly with style by studying in both stone and brick districts, by which means he can see the variations and different types of construction and ornamental detail produced in both. It is, for example, quite impossible to study Gothic by seeing brick buildings, however good they may be; and it is even more true that Classic architecture cannot be learned in the brick districts. For practical building purposes the student has need of a deeper acquaintance with stones. Geological formations, texture, stratification, chemical composition, and colour ought to be studied apart from textbooks. The study in itself is as extensive as it is absorbing and interesting. But we have said enough to suggest the topic as one of interest and inquiry to the intelligent holiday maker.

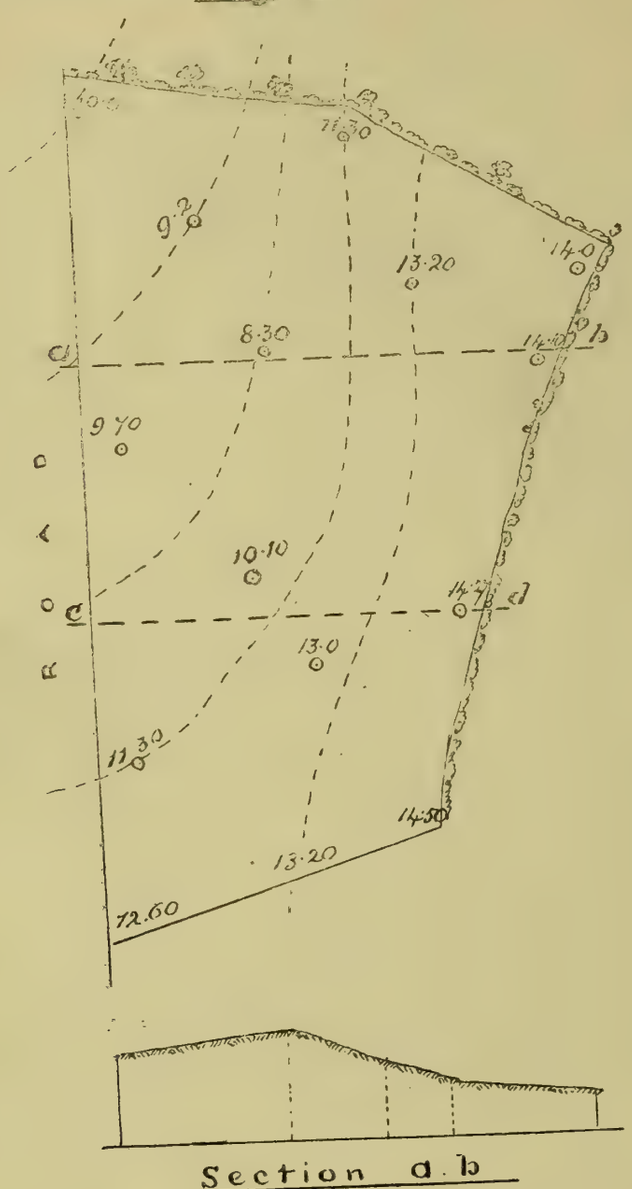
The tourist who devotes his time to sketching and measuring has a yearly decreasing field open to him. What with photography and the means for reproducing the photographic impression on paper, and the works already published illustrating our great churches, abbeys, and domestic edifices, there is little that has not been ransacked. Yet even he can do much in the remoter parts of the country, and if he has any inclination to put his acquired information into print, he has facilities. It is extraordinary how little has been done in some directions of architectural information and illustration. Very few have yet undertaken to describe and illustrate buildings used for special but prosaic purposes, because they are less attractive than a sojourn among our ancient churches and mansions; but they may have an interest for many. Say, for example, notes and illustrations of our great manufactories, our provincial colleges, schools, and museums, academic and technical. The paucity of illustrations of plans and interiors must have been noticed by all. Elevations and perspectives we have had in abundance; but the plans of great buildings are few. Here there are ample opportunities for examination and careful data, and those who have leisure may well devote their time to the filling up of this important branch of architectural study. Carefully-drawn plans of our churches and civic buildings are required. As the interiors of buildings are often inaccessible, they have been passed over by the general artist, and this is the case more especially with domestic structures, whose owners are not always willing to throw open their doors. We make the suggestion, however, in the hope that some of the visitors to provincial districts may find the time and opportunity to contribute something towards the supply of a branch of architectural data that is at present very imperfect, and which those who have written and discoursed on architecture have not always been able to furnish. Architectural data to be of value should be precise. The plan of a building giving the leading measurements becomes at once a means of testing the accuracy of elevations and perspectives; but it gives details which the most elaborate view cannot supply. In studying interiors, which are, after all, the kernel and aim of the design, we require the plan to give us an idea of the proportions, the staircase and hall arrangement, as for the architect it unfolds the motive and intention of the whole design. Again, a plan of a structure and the details of a part furnish the student with all he needs to know, and is the most accurate description of a building he can possess. In these directions the architectural student has more than one way of occupying his time, should he desire to avail himself of opportunities within his reach.

LEVELLING.—XIV.

BUILDING SITES.

THE process of levelling we have discussed in our last papers, by contouring, is very useful when large tracts of hilly ground have to be levelled. In preparing sections of building land the surveyor may have recourse to simpler methods of levelling. Let us imagine a large estate, sections of which are required. The surface has a considerable slope to one side, or a dip to one corner, and the road along one boundary of it is consequently higher at one end than the other. The architect and builder must determine the amount of excavation required for a row of houses, how much soil has to be removed for the cellars at each plot, and the digging required for drainage and filling-in. For these purposes it is necessary to take a series of levels along both of the longer sides of the ground, and two or more cross-sections. We have shown a method of taking the levels by fixing the instrument at one or two convenient spots, and placing the staff at certain points along the boundaries and entering the results as back- and fore-sights and intermediate levels. Another plan we shall now refer to, which is rather an easier mode of operation. Levels are taken along each boundary and marked on the plan, in addition to any particular levels necessary in the centre of the ground to indicate any sudden rise or hollow. These levels are reduced to a datum. The bottom of any ditch or pond is taken; also any point on the surface that may be necessary to be fixed. Beginning at a bench-mark, or some fixed point in the boundary, or at one corner of the ground, the staff is carried from point to point wherever the surface changes, and if any hedges be crossed bench-marks are fixed on each side for the purpose of reference. The levelling is carried on in this way till the initial B.M. is arrived at. A plan marked with such levels in circles denoting the positions, these being determined by a few dimensions, will enable the

Fig 31



Section a b

surveyor to prepare the necessary sections in almost any direction he pleases. The levels are proved by the coincidence of the closing datum levels at the initial B.M.

If we imagine the points of site thus determined to be the prominent elevations and depressions, and lines connecting any two of them a gradient, it would be easy to draw a contour section in any direction. The points thus selected must be carefully fixed on the plan by measurement. For this purpose stakes should be driven level with the ground at each point, and the staff placed on each. Our plan (Fig. 31) will exemplify the process. The several levels marked are taken from a given datum plane, the dotted lines showing imaginary contours. These are not necessary, however. Beginning at one corner of the side next road, fix a bench-mark, say, at the level 10·00, and then proceed to take the readings along the boundaries 11·3, 14·0, 14·27, 14·50, 13·20, 12·60, 11·30, 9·70. From these readings it will be noticed that there is a fall of 4ft. along the crooked side of field from the first B.M. to the corner, and a fall of 0·50 along the side parallel to road, the lowest corner being that marked 14·50. The greatest rise is 8·30, which marks a prominence on the ground, the other levels on each side indicating that it forms a kind of ridge, as shown by the dotted contour. It will be seen that five points in the centre of the site are levelled, the lowest of these being 13·20, the highest 8·30. Drawing a line between any two of these points, as between 8·30 and 13·20, there will be an assumed gradient line, the fall being 4·90; from 13·20 to the corner 14·00, the difference of level is 0·80. Thus a section taken through the three points 8·30, 13·20, and 14·0 would show two lines of gradients, a steep incline and one of less inclination. Also a section through the line indicated on plan by *a b* will give first a rise of 0·90, then a fall of 3·00; from this to the next level a fall of 1·90, and next a falling gradient of 0·80. Another section can be taken at *c d*, and indeed it would be possible to make a section in any direction having the horizontal measurements and the lines of gradients from point to point. The first bench-mark may be fixed at a certain level above datum, say 10ft., and from this level the heights of the floors can be determined. The student will see how easily this mode of determining levels can be adopted for plots of limited area, saving the ordinary level-book, and enabling the architect or surveyor to plot any section of the ground he desires. The datum level is assumed to be a plane below the lowest level of the ground, the differences of level being added to or deducted from it.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—XLVII.

By Henry Lovegrove, F.S.I., Surveyor.

CEMETERY CHAPELS.

Bills (*continued*).

CARPENTER AND JOINER.

The timber and the deals to be of the best quality from the Baltic, and the oak to be of English growth.

Sqs.	ft.	in.			£	s.	d.
	18	0	Sup.	Centring to segmental arch			
	113	0	,,	Do. to Gothic pointed flat arch with splayed soffit			
	20	0	,,	Do. to flat pointed stone arch with moulded soffit			
	72	0	,,	Do. to Gothic pointed stone arch			
	15	0	Run.	Turning piece for flat arch 4½in. soffit			
	43	0	Cube.	Fir in wall plates and lintels			
	92	0	,,	Do. in ground joists and sleepers			
	344	0	,,	Do. framed			
	83	0	,,	Do. do. in roof trusses, including hoisting			
	1231	0	Sup.	Labour planing on fir			
22	50	0	,,	2in. by ¾in. sawn battening spaced for countess slates			
	48	0	,,	¾in. do. lier board			
1	5	0	,,	1in. do. boarding for slates			
1	20	0	,,	1in. do. close-jointed do. for lead			
	13	0	,,	1in. do. do. and fittings			
	133	0	,,	1in. do. gutter-board and bearers			
22	50	0	,,	1¼in. do. boarding for slates			
22	50	0	,,	Inodorous roofing felt, and allow for laps and waste			
13	20	0	,,	1¼in. yellow batten wrought, ploughed, and tongued floor, laid straight joint with splayed headings			
	14	0	Run.	Mitred border to hearth			
	34	0	Sup.	2in. wrought framed ledged and braced doors, filled in with 1¼in. wrought, V-jointed both sides, tongued boarding in 3⅔in. widths			
	88	0	,,	2⅔in. wrought and framed folding doors, filled in as last, Gothic pointed head measured square			
	100	0	,,	2in. moulded and chamfered framing, with opening for, and including mullion and transom, Gothic pointed head and cusped soffit			
	40	0	,,	2in. framing, filling into gablets with three openings, trefoil heads, with chamfered edges measured square			
19	36	0	,,	⅞in. wrot. one side and V-jointed, diagonal boarding fitted between purlins, including all cutting and waste			
	35	0	Run.	Labour rebate			
	35	0	,,	Labour chamfer			
	314	0	,,	Labour sawn splay on ⅞in. diagonal boarding			
	110	0	,,	Labour do. on 1in. boarding			
	6	0	,,	Labour do. on 4in. fir			
	12	0	,,	Labour, raking, cutting on 1¼in. floor			
	80	0	,,	Raking, cutting, and waste on ⅞in. boarding			
	174	0	,,	Do. do. on 1in do.			
	255	0	,,	Do. do. on 1¼in. floor			
	194	0	,,	Tilting fillet			
Ft.	in.						
63	0		Run.	Chamfered fillet as architrave and mitres			
15	0		,,	Do. circular			
42	0		,,	1in. wrought one side fascia, 5in. wide			
54	0		,,	1ft. by 7in. wrought and chamfered skirting, with grounds and backings plugged to walls			
				No. 8. Mitres to do.			
145	0		,,	1in. wrought one side, and framed fascia 11in. wide, fixed raking to form cornice			
6	0		,,	2in. rounded roll for lead			
				No. 4. Mitres to do.			
83	0		,,	2in. birdsmouthed do.			
				No. 8. Mitres to do.			
				No. 24. Stopped ends			
27	0		,,	3⅔in. by 2in. wrought door stop			
15	0		,,	Do. circular			
36	0		,,	4in. by 3⅔in. fir, wrought framed and stop-chamfered frame			
27	0		,,	5in. by 4in. do. do.			
15	0		,,	Do. circular, including all heading joints			
3	0		,,	4in. by 4in. cut and rounded roll, birdsmouthed			
				No. 4. Stopped ends to do.			
187	0		,,	Moulding out of 2in. by 2in.			
				No. 8. Mitres to do.			
102	0		,,	Do. out of 3in. by 2in.			
				No. 16. Mitres to do.			
47	0		,,	Do. out of 4in. by 2in., planted on			
				No. 12. Mitres to do.			
				No. 4. Stopped ends			
25	0		,,	Moulding out of 5in. by 2in.			
				No. 16 mitres to do.			
187	0		,,	Do. out of 5in. by 3in.			
				No. 8. Mitres to do.			
				Do. out of 6 by 3			
98	0		,,	4in. by 3in. moulding as cornice			
51	0		,,	No. 10. Mitres to do.			
				No. 4. Stopped ends do.			
6	0		,,	Moulding out of 4in. by 4in., framed in short lengths			
10	0		,,	Do. out of 6in. by 4in. framed both edges with cusped soffit			
105	0		,,	Do. out of 9in. by 4in., fixed on			
				No. 48. Mitres to do.			
42	0		,,	Do. out of 9in. by 6in. as cornice			

No. 1. Dozen deal joint bricks and building in
No. 8. 2in. deal cross rebated drips and risers
No. 4. Deal rounded rolls
No. 8. Do. dovetailed cesspools
No. 16. 3in. fir wrought and framed brackets, tenoned into stone corbel, circular on front edge and moulded, 3ft. 10in. by 3ft. 10in.
No. 16. 3in. do. do. do. ribs cut circular on front edge and moulded, 4ft. by 4ft.
No. 12. 3in. do. do. do. do. fixed against wall forming arcading, cut and moulded as last described, 3ft. 3in. by 4ft. 8in.
No. 4. 4in. fir wrought and framed bases to flying buttresses, 1ft. 3in. wide, 3ft. 9in. high, birdsmouthed, bottom edge to fit angle of base of flèche
No. 4. 4in. by 4in. do. do. do. buttresses, with moulded and shaped tops, and moulded necking, out of 5in. by 2in., mitred to same, 6ft. 9in. high
No. 4. 4in. by 4in. do. do., moulded and shaped angle post, 10ft. 3in. high, including necking and moulded plinth

IRONMONGERY, SCREWS, AND FIXING.

No. 2. Pairs 4in. wrought iron butts.
No. 6. ,, 5in. do.
No. 2. ,, ornamental strap hinges, p.c. 30s. per pair
No. 4. ,, do. do. p.c. 40s. do.
No. 2. 9in. square iron bolts
No. 2. 18in. do.
No. 4. 8in. oak bound stock locks, with ornamental bands and escutcheon
No. 4. Iron dowels and mortises in fir and York stone

Ft. in.
65 0 Sup. Galvanised iron wire panel and fixing in wood framing as bird stopping

SMITH.—CAST IRON AND FIXING.

161 0 Run. 4in. by 3½in. rectangular rainwater pipe, with collars cast on, fixed with red lead, watertight joints
No. 6. Extra to swan-neck bends in do.
No. 10. Do. do. plinth do. do.
No. 10. Do. do. shoes do. do.
No. 4. Moulded heads
123 0 Run. 6in. by 4in. moulded eaves gutter, with red lead joints, and fixing with proper brackets, &c.
No. 16. Mitres in do.
No. 18. Stopped ends do.
No. 6. Outlets
No. 2. Ornamental gratings, 3ft. 6in. by 2ft., and fixing in floor
No. 2. Register stoves to openings 1ft. 9in. wide, 10s. p.c.
Provide the sum of £25 for two patent stoves of approved manufacture, and allow for profit, carriage, and fixing

Cwt. qs. lb. WROUGHT-IRON AND FIXING.

0 1 0 In chimney bars, with ends split, &c., and building in
2 2 21 In forged straps
3 1 14 In ¾in. screw bolts, fixed through solid fir

Ft. in.
143 0 Run. Stay bar for lead lights and fixing
No. 8. Coach screws, 6in. long
No. 1. Ornamental finial p.c. £5, with long rod and properly fixing to flèche 52ft. from ground level
No. 2. Wrought-iron hopper ventilators, p.c. 25s. each, and fixing in windows glazed with lead lights complete
Provide and hang a bell weighing 2cwt., to be purchased from Warner, of Clerkenwell, with iron stock and frame, and all necessary wood framing, with pipe and chain for upper part, and strong rope of the requisite length—about 30ft.

Yds. ft. in. PLASTERER.

399 0 0 Sup. Twice colour on stucco
360 0 0 ,, Render float and set finished rough stucco
7 0 0 ,, Do. to circular soffit
147 0 ,, Do. to narrow splayed reveals
59 0 ,, Do. do. do. sill
73 0 ,, Do. do. circular soffite
120 0 0 ,, Render, float, and set trowelled smooth for paint
60 0 Run. Labour to chamfer on stucco
No. 12 mitres to do.
2 stopped ends do.

Ft. in. PORTLAND CEMENT.

14 0 Run. Angle and arris
220 0 ,, Labour forming 2in. staff bead and double quirks
1 3 0 ,, Do., do circular
No. 3. Mitres to do.
No. 12. Apex do. do.
No. 24. Stopped ends
No. 4. Moulded do. do.
4 ,, Moulding 8in. girth
37 ,, Do. Circular
No. 4. Mitres
No. 2. Apex do.
No. 4. Mitred and returned stopped ends
221 0 ,, Moulding 9in. girt and colour
No. 14. Mitres to do.
No. 6. Stopped end
No. 2. Mitred and returned do. do.

Cwts. qrs. lb. PLUMBER.

61 0 21 Milled lead and labour in gutters, flashings, &c.

Ft. in.
5 0 Run. Labour cutting and shaping 6lb. lead to base of finial
59 0 ,, Close copper nailing
No. 8. Extra to drips in gutters
No. 6. Labour dressing 6lb. lead through hole 10in. long and 2in. diameter
No. 8. Mitred intersections of lead roll
No. 16. Stopped end to rolls on splay
No. 88. Soldered dots and screws
No. 8. Extra labour and solder to cesspools
No. 8. Pieces of 3in. lead socket pipe with one end soldered to lead cesspool (about 2ft. 6in. long)

Ft. in. GLAZIER.

210 0 Sup. Lead lights and glaging p.c. 2s. 6d. per foot sup. in stone
154 0 Run. Circular cutting and risk on lead lights Leave glass clean and perfect

Yds. ft. in. PAINTER.

325 0 Run. Four oils on bar, strap, &c.
161 0 ,, Do. rainwater pipe
123 0 ,, Do. eaves gutter in and out
No. 1. Do. on ornamental finial
No. 2. Do. on hopper ventilators both sides
120 0 0 Sup. Four oils in cement on plaster
221 0 Run. Do. on do. moulding 9in. girth
25 0 0 Sup. Size, stain, and twice varnish
42 0 Run. Do. framed one side
54 0 ,, Do. skirting
448 0 0 Sup. Stain, and one coat of boiled oil rubbed in

WORKING CLASSES' DWELLINGS ACT AND THE OBLIGATION OF LANDLORDS.

THE case heard in the Court of Queen's Bench before Lord Coleridge and Mr. Justice Mathew, arising out of the 12th section of the Working Classes' Dwellings Act, 1885, is of interest to landlords and tenants of a large class of dwellings. In the section of the Act, it enacts that in any contract for letting for habitation a house or part of a house, "there shall be implied a condition that the house is in all respects reasonably fit for human habitation." We reported the particulars of the case referred to in our last issue. The defendants, who are builders, have erected a number of dwellings, and let to plaintiffs three rooms in a block in Bermondsey in 1887. There were falls of ceilings on three separate occasions, on the two last of which persons were injured. An action was brought by the plaintiff to recover damages on these grounds—first, that there was a breach of warranty that the ceiling was sound; second, wrongfully leaving ceiling in an unsafe state; and third, on the enactment in the statute. After discussing the Act, the County Court Judge left the case to the jury, who found for the plaintiff, damages £50. The appeal against this judgment by defendants was grounded on the plea that the word "condition" in the enactment did not give a right of action by the tenants, only a defence against an action by the landlord, that the Act intended to apply to sanitary defects, as bad drains. To this the Court demurred, as it would give no relief to the tenants, and Lord Coleridge, in giving judgment, said it would be irrational to give to the word "condition" so narrow an interpretation as that urged by the landlord. Upon this ground he confirmed the verdict of the County Court Judge. This view was concurred in by Mr. Justice Mathew, and the appeal was dismissed.

No other decision could have been fairly given. The implied condition that a house is to be in all respects reasonably fit for habitation, can only mean that the house "in all respects" is to be fit for the purpose it is let for. If the ceilings are so badly constructed that they fall on the heads of the inmates, the house cannot be fit for habitation. It may be as well contended that if the walls are unsafe, and portions of them fall, or the roof allows the rain to come through, the house is fit to be inhabited. Such a view was never contemplated by the framers of this Act, as there would be no security if a landlord let a house or rooms in such an unsafe condition.

The law of tenement houses, as regards the roof, imposes upon the landlord the duty of its repair, and this ruling is upheld in the case of "Kruegar v. Ferrant" (American reports), where it was laid down as a principle applicable to the roof and all other parts of a tenement house that, in the absence of express demise, the roof and all other parts must be considered as remaining in the landlord's occupation and control.

Let us imagine a house let out to various tenants. Is the upper tenant under any obligation to afford shelter to those below him, and to do necessary repairs to the roof? Authorities differ. It is contended that, if such an obligation existed, it would be in opposition to the rule of other easements that the person subject to the easement is under no obligation to keep it in a state of efficiency. Other arguments may be brought forward to prove that, if tenements are let to different persons, they do not thereby contract to keep the roof in repair. No right is conveyed to the tenants by this leasing of the floors to control the roof, and therefore they cannot be regarded as liable for its repairs. Where there is a condition under statute that a house is to be reasonably fit for occupation, there can be no doubt whatever; the nice question of the obligation of tenants to keep in repair the portions leased to them, so as not to cause inconvenience or discomfort to those in upper or lower floors, does not arise. Under the Working Classes' Dwellings Act promoters of dwellings agree to build commodious and convenient rooms for their tenants, and they are therefore legally bound to carry out their part of the agreement. We are, therefore, glad the Court has shown its authority, and that the law and right of the case have not been sacrificed to a technical quibble like that raised by the defendants. It would have been a dangerous precedent for future tenants of this class if the condition had been construed in the manner suggested; worse than all, it would have been a tacit sanction for all sorts of evasions in building.

The working classes under these salutary Acts are protected; but the middle-class tenant is left without any legal protection whatever, and is at the mercy of the "jerry" builder. If his ceilings fall on his head he has no redress, as it does not come under the duties of the district surveyor; if his roof lets in the rain he has no one to appeal to except the landlord, who will do nothing; if the drains are laid badly he has to endure the consequences whenever there is a storm. In short, he has no means of redress, except an action at law, which would be a doubtful and expensive mode of obtaining justice. The tenants of dwellings under the Artisans' Dwellings Acts have something at least to fall back upon if they find the house is unfit for human habitation. It is time all who take houses should be guaranteed against structural and sanitary defects, and it is only legislative machinery that can help them.

BURGOS AND TOLEDO.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

HERR VON ERNST WASMUTH, of the Markgrafenstrasse, Berlin, the well-known architectural publisher, is now adding to the long series of valuable folios of photographs which have been issued in permanent ink from his establishment during the past few years, by publishing a beautiful work illustrating the architecture of Spain and Portugal,* from photographs specially taken for the book under the direction of Professor Constantine Uhde, of Brunswick. The first part is now before us, and by special permission we are enabled to present our readers with two phototint reproductions, somewhat reduced in scale, as specimens of the plates under notice. Naturally some of the exquisite tone and clearness in the details of the original prints are lost in the second process; but the photolithographs show sufficiently well for the present purpose how admirably the subjects and points of view have been chosen. The plates in this first portfolio are both very varied and comprehensive in character, representing as they do Gothic, Moorish, and Renaissance work with equal care. Thus in following the order of the index we have a general view of the University or Colegio de San Ildefonso at Alcala de Henares, founded in 1498 by Francis Ximenez de Cisneros, Archbishop of Toledo. The vast façade of this immense establishment is built entirely of marble on a grey granite base, and measures about 100ft. long by 60ft. high. The school thus rebuilt from the designs of Pedro Gumiel, and finished under another architect, Rodrigo Gil Houtanon, became second only in importance to its rival at Salamanca, and is reckoned as one of the earliest, as indeed it was among the most important, undertakings of the first half of the 15th century. The detail of the front is rich and exuberant in the ornament of its design, eminently characteristic of the lawless freedom with which the Spaniards delighted to record their joy at the expulsion of the Moors, and affording a striking contrast to the severe man-

* Baudenkmaeler in Spanien und Portugal. Herausgegeben von Constantin Uhde, Professor an der Herzoglichen Technischen Hochschule in Braunschweig. Berlin: von Ernst Wasmuth, Markgrafenstrasse 35.

nerism of earlier work. More marked still is the present forlorn condition of the place as compared with the days of its prosperity, when there were grouped round this Alma Mater no less than 11,000 students and 19 colleges. The buildings contain three Patios of different styles, and the student will find the structure amply represented in the great government publication, the "Monumentos Arquitectonicos de Espana"; but the cost of this work necessarily places it beyond the reach of the majority. The University was commenced about 1510, and finished about 1550 or a few years earlier. The archiepiscopal Palace of Alcala de Henares was founded upon the old Alcazar, and the new work, ascribed to Alonzo Berruguete and also to Alonzo de Covarrubias, is commonly described as Plateresque, although the Patio of the Arzobispado clearly excites a far more forcible reminiscence of good Cinque-cento work, and not unlikely was due to the skill of Domenico of Florence, who designed the marble monument of Cardinal Cisneros, the Wolsey of Spain, in the chapel built by Gil de Ontanon, which no visitor to the "Colegio" of Alcala should miss seeing. Herr Wasmuth gives us a photograph of the Moorish Council-chamber of the Palace, with its elaborately-decorated open-timbered roof (Plate 2). The west front of Burgos Cathedral furnishes the next sheet, showing admirably this well-known building, which is so fully described in Street's "Gothic Architecture of Spain," where a useful plan is given. The Convent and Church of Las Huelgas at Burgos is by far a less familiar subject, and thus we have chosen it for our present plate, which shows the porch at the end of the cloister flanking the north of the nave, and situated in the centre of the façade of the north transept of this notable church. The steeple, with its massive belfry stage, rises to the east of the portals, and beyond it again is an apsidal-ended chapel. Other four chapels occur on the east sides of the transepts, and a lantern crowns the crossing at the entrance to the choir, and is surmounted by a low conical spire, not seen in the accompanying view. When Street sketched the church, the transepts had high roofs, if we may trust his drawing ("Gothic Architecture in Spain," plate 4, page 38). Santa Maria la Real de las Huelgas was founded by Alfonso VIII., son of D. Sancho el Deseado, at the instance, it is said, of Leonor, his Queen, daughter of Henry II. of England. The dates given for the work are as follows:—The Monastery was commenced in A.D. 1180; inhabited on June 1st, A.D. 1187 ("Maurique Anales Cisterciences," III. 201); and in 1199 formally established as a house of Cistercians. The first Abbess ruled from A.D. 1187 to A.D. 1203, and the second—Dona Constanza, daughter of the founder—from A.D. 1203 to A.D. 1218; and from that time forward a large number of noble persons here took the veil, whilst kings were knighted, crowned, and buried before its altars. The place now is surrounded by a dreary, desolate, and forlorn-looking Spanish village, though the convent is still ruled over by the Lady Abbess—no doubt with terribly shorn and shrunken revenues. The boundary walls shut in the convent on all sides, and the only public way into the great church is through the porch, which we illustrate to-day. No one is admitted within the cloister. The lantern over the central compartment of the transept is groined with an eight-sided vault. The choir has one bay of quadripartite and one of sexpartite vaulting, and an apse. The transept chapels are all of them square on plan; but by the introduction of an arch across the angle (the space behind which is roofed with a small vault) the vault is brought to a half-octagon at the east end. "Nothing can be more peculiar," says Street, "than this description of early vaulting, and it is one which I believe originated in Anjou or Poitou, where numberless examples may be found, all more or less akin to this at Las Huelgas." This may be due to the probability of some architect from Angevine being introduced by the influence of Leonor, Henry II.'s daughter, though, on the other hand, Street says he thinks the peculiarity of detail indicates that the architect was really a Spaniard, in which case he must have been familiar with French and English buildings. The nave is groined with a quadripartite vault, but being screened off for the use of the nuns, it is impossible to exactly describe the building. There is a good 15th-century organ with painted shutters over the nuns' stalls worth naming. The west front is very English looking; but the Moorish battlements to the adjoining gateway and cloister wall add a character all its own. The detail of the church is very refined, and is broadly treated. The rose window in the transept porch, with doubled traceries and shafts, set one behind the other with fine effect, the elaborate corbel tables and the doorway to the smaller porch—rich with chevron and dog-tooth—ought to be particularly noticed. To see the church, Street says you should rise with the lark, as the building is closed to visitors at ten in the morning. The Alhambra naturally supplies ample material for illustrations, and the next four plates are all from Granada. First, the Lions' Court is capitally shown, followed by details of the Moorish ornamentation, of which the interior of this masterpiece furnishes such a wealth of diversity and richness. The Calatrava Church at Madrid is one of the most important in that thoroughly modern city; but Seville Cathedral, which is next illustrated, makes a grand plate, and the great entrance to the Convent of St. Paul is equally interesting with the delicately treated scraffito ornament between the hood mould and the outer order of the archway. The tympanum is similarly treated. The "Alcazar," or "Royal Residence," is the principal monument of Moorish magnificence still left in Seville. It was commenced by Jalubi, the architect of Toledo, in 1181. We have in Herr Wasmuth's work a beautiful print, giving one of the bays of the arcade to a large scale. The Palace of San Telmo is very late and coarse in the style of the enrichments of its grand entrance, which are of the Rococo order, very much overdone, but typical of the style. Seven sheets are devoted to Toledo, including general views overlooking that fine and impressive city with the vast mass of its Alcazar dominating everything. The famous bridge of the Alcantara occupies one of the best plates in the book, and the beauty of the print cannot be overstated easily. At one end it is guarded by a gateway of the time of Charles V., and on the town side by one of semi-Moorish character. Above it, on entering the city, are seen the picturesque apses of the old church of Santiago and the tolerably perfect remains of the double *enceinte* of the city walls. The cathedral is nicely photographed, and we are furnished with an interior of the Synagogue Santa Maria la Blanca with its horse-shoe arches. The Hospital of the Holy Cross, which is generally accepted as the finest example of Plateresque (literally silversmith's) architecture in Spain, is represented by a nice detail of the principal portal, which alone supplies a fund of suggestive work, well worthy of note, both as to what to avoid as well as imitate. The cortile of this Foundling Hospital of Toledo, like the rest of the interior, is more deserving of study, and here it is that Henrique de Egas has best shown his command over the style which he so ably made his own. The photograph of his gracefully-designed arcades, as here represented, is a most valuable print, which cannot fail to be useful as well as interesting, for it shows "one of the gems of the world," as Ford calls the building, standing on a commanding site overlooking the "glorious Tagus." The Puerta del Sol, or Gate of the Sun, which forms the subject of our second illustration, is the most famous of the projecting towers built in the city walls on the north side of Toledo. It is the first of the series reached on entering the city, and may be described as in all respects a dignified and noble work of art. The variety of arches, one behind the other, which is seen here, was a very favourite device of the Moorish architects. Here there are four, two pointed and two round, but all horse-shoe in their outline. The intersecting arcades in brickwork over the arch, and the projecting turrets on a level with them, are extremely picturesque. The gateway is so placed that the sun at dawn is seen through the opening, rising over the town. The materials used are wrought stone, rough walling stones, and brick. The battlements are of a type which was repeated by the Christians in most parts of Spain, but was, no doubt, derived first of all from the Moors. Over the entrance the medallions illustrate the arms of the cathedral of Toledo, with the B.V. Mary appearing to San Ildefonso. "The situation of this gateway," says Street, "is charming: with due regard to military requirements it turns its side to the enemy, and is reached by a winding road, which bends round at a sharp angle just before reaching it. To the left a fine view is obtained over the Vega, watered and made green by the kind river, a view which gains immensely on one's liking, compared, as it always is, with the dreary arid hills beyond, and with recollections of the weary waste over which so much of the travellers' road to Toledo must needs be." The age of the Puerta del Sol is not known, but its date probably may be correctly attributed to the end of the 12th or beginning of the 13th century. Street compared it carefully with the Puerta de Visagra, the finest gateway in the outer wall, which was erected *circa* 1108-26, and so arrived at this opinion. From these illustrations and descriptive remarks it will be seen how interesting a work Herr Wasmuth's publication will prove to be, and we recommend it to the attention of our readers with confidence.

CUMULATIVE STRESSES AND VIBRATION IN BRIDGES.

WE notice a paper in the April number of the American *Transactions of Civil Engineers* entitled "Stresses in Bridges." The author, Mr. William H. Booth, member of the Society, notices the tendency there is of modern Americans and the last English practice towards a reduction of the amount of the factor of safety, which is now very aptly called the "factor of ignorance." Mr. Booth suggests the better and less obnoxious term, "factor of uncertainty." Many of our bridges have been designed upon formulæ that will not bear experimental investigation, and the factor of safety has been at least a useful cover to ignorance or imperfect data. Mr. Booth says, "a reduction in the factor is to be made concurrently with a more accurate determination of actual as distinguished from apparent loading." Our ignorance of the effects of a moving load, or the manner and direction of the stresses in a complex iron structure, has been the main cause of the uncertain factors adopted by engineers. The increased stress produced by suddenly applied loads is one of the qualities yet to be accurately found. A suddenly applied load can no doubt be calculated, like a static load; but is of much greater effect on the structure. The varying positions of the members and details require the engineer to discover the particular stresses produced by a rapidly moving load, such as a locomotive or train. Mr. Booth, in his paper, deals with several of these points. The causes of increased load action are, he says—(1) that due to the suddenly applied load; (2) those connected with the structure, like general deflection, which induces increased stress by centrifugal action; (3) the relations between the load and the structure, foremost being the relation between the drive-wheel circumference and the panel length of bridge, and also the wheel-spacing of the train. We have no opportunity of entering into the subject here. The suggestions for increasing the wheel loads, the addition to the truss-stresses for cumulative vibratory action, are sensible. The maximum cumulative effect is to be most avoided and dreaded, and this effect can be learned by discovering the train speed for each class of structure that will give the maximum effect, so that it may be avoided.

ARCHITECTURAL REGISTRATION IN CANADA.

THE architects of Ontario have formed themselves into an association with the object of seeking an Act of Incorporation at the next session of Parliament. The profession there are thoroughly united as to the desirability of such a measure, and anticipate no difficulty in obtaining their Act at an early date. We heartily wish them success.

The memorial stone of a mission hall, which is to be erected in Quorn-street, Edge-lane, in connection with St. Cyprian's, Edgehill, was laid on Friday by the Mayor of Liverpool. The building, which, when completed, will have accommodation altogether for 1,000 children, will consist of two stories—the upper room to be the mission room, and the basement to be devoted to Sunday school purposes. The assembly room will be capable of containing close upon 400 persons. The building is of grey brick with red dressings, and the style is the simplest Gothic. The architects are Messrs. Willink and Thicknesse, and the contractors Messrs. Joshua Henshaw and Sons.

The London County Council have decided to build three-story blocks of artisans' dwellings on part of the land recently cleared in Hughes Fields, Deptford, at a cost estimated by their superintending architect, Mr. Thomas Blashill, at £40,000.

WAYSIDE NOTES.

THE London architect suffers from many hampering restrictions that his rural brother escapes. It is true he is now rid of the importunities of peccant officials of the late M.B.W., although time only will show the sort of treatment he will receive at the hands of county councillors. But what with by-laws, restrictions, and, worse than all, ancient lights, he often has a lively time during the progress of either little or big works. He has trouble in the foundations that the country architect wots not of; he has his design cut up by the authorities, and his projections curtailed by the powers that be, and he is plunged into litigation by the owners of the "rabbit-hutches" hereinbefore alluded to, whilst yet his walls are barely out of the ground. Yet still there is a further trouble in store for him, and one that grieves him sorely, though to the other parties concerned it appears trifling. I allude to the malefactions of the sharp-eyed linesmen who look covetously upon his sturdy chimney-stacks as likely to form admirable supports for telegraph and telephone wires innumerable. The well-grouped masses of flues that our architect has relied upon for an effective skyline are ruthlessly seized, and thenceforth the observer notes not his delicately silhouetted building, for his eye is forcibly drawn away by the myriad of radiating wires.

Irrespective, then, of the question of danger to life and limb, we should all be glad if the telephone and telegraph wires were relegated to subterranean passages or conduits. The proposal to thus deal with these offenders is periodically discussed in Parliament, and the latest discussion on the subject occurred last Monday. The Duke of Marlborough described the increase in the number of overhead wires as a gigantic public nuisance, and suggested that, where overhead wires were absolutely necessary, there should be controlling and regulations. This end he thought best attained by the appointment of a joint committee of both Houses. Lord Salisbury hinted that perhaps the control of these matters came within the jurisdiction of the County Council. It appears, however, from a statement made by Lord Balfour of Burleigh, that the Board of Trade will soon be in a position to submit to Parliament regulations relative to overhead wires so far as regards those for telegraphs and telephones, and that preparations were also being made for the removal of overhead wires for the supply of electric light. It is certainly high time. The system is fraught with much danger, and is attended with much annoyance to those who have to carry other people's wires with no benefit to themselves. From an architectural point of view, as I have said, it would be a great gain to clear the sky of these huge cobwebs of wire. There are many city buildings quite disfigured by the erections placed upon them to carry the wires. If it were absolutely indispensable that they should be carried overhead, one would not mind, but look upon them as needs of the day to be met in a proper spirit. But so far as I know, they can be conveniently stowed away underground if proper provision is made for their reception. And if there is nothing provided, the necessary alterations should be made. In new thoroughfares there can be no excuse for not making convenient subways for wires, and of such description as to separate the mild telephone and telegraph wire from the fiercer electric-light wire, a separation which is, I believe, most necessary.

Although the chairman objected to the scheme, the County Council has decided to proceed with the proposed alterations of the Council Chamber and offices at Spring-Gardens. Quantities will be prepared and tenders invited in the usual manner. The estimated cost of the alterations is £7,500. If the improvements be effected, the councillors will have accommodated themselves very cheaply — whether with true economy, is another matter. Many will think, with Lord Rosebery, that the wisdom of the proposed expenditure is much to be doubted. His lordship's opinion was based on the following suppositions:—That he believes they would never be able to recover the money if they wanted to dispose of the premises; that it would tend to keep the Council for a much longer period houseless and homeless; and that, in fact, whatever was expended upon the alterations at Spring Gardens, and whatever was done with the premises with a view to making them into a permanent habitation for themselves, was money and energy absolutely thrown away. The words of their chairman were, however, equally thrown away upon the councillors, and in due course we may expect the patching up of the Spring Garden's nest to be commenced in earnest. Sooner or later Lord Rosebery's words must come true. The County Council will find there is not room to swing the traditionary cat in their offices, and will be compelled to consider the question of erecting an Hôtel-de-Ville worthy of the Metropolis. Then will the shortsightedness of the present policy become patent to all.

It is reported that old George Dance's masterpiece, Newgate Gaol, is before long to be pulled down to make room for a new Central Criminal Court, plans for which, it is said, have been already prepared. About six months will be given to the building before it is destroyed, during which period the gruesome horrors of the historic prison will be on view to the public at 6d. per head. Notwithstanding the praise given to the façades of this gloomy structure, I expect there will be none found to raise any objections to its removal on the score of its artistic excellence. Even Fergusson might, perhaps, have witnessed its demolition without great regret, in spite of his belief that "if any architect would only design a church or a palace on the same principles on which old George Dance designed Newgate, or as an engineer designs a bridge, he would be astonished to find how simple the art of architecture is, and how easy it is to do right, and how difficult to do wrong, when honestly bent on expressing the truth, and the truth only." This is saying a great deal, and, it would not be difficult to show, vastly too much; but the façades of this building are certainly remarkable, and should be examined by those who have hitherto supposed it a piece of barren, commonplace design, before they are razed to the ground.

There is another rumour in the air, and that is that Lord Portman intends erecting a most sumptuous mansion. Mr. Norman Shaw, it is said, is to be the architect, and the magnificence of the building is to be such as would have been envied of Cardinal Wolsey. It is stated, indeed, that the fabric will be a copy of Wolsey's palace at Hampton Court; but this, I conclude, is one of those extraordinary popular delusions on the principle of that which avers St. Paul's to be an exact replica, on a smaller scale, of St. Peter's at Rome. Lord Portman wants to outdo Lord Cadogan, another great London landowner. There is nothing like a little healthy competition and rivalry among the builders of mansions. It is good for trade.

What is Mr. Pearson going to do at Rochester? A week or so back I noticed in the *Athenæum* that the choir-screen and choir-wall were to be pulled down, the latter to be transformed into a piece of commonplace arcading. Wholesale restoration is evidently contemplated at this cathedral, for in addition to this rumour is one to the effect that a spire is to be added to the tower. The Dean of Rochester is, I conclude, to be responsible for the alterations to be effected. They are a tiny bit Grimthorpean, it may be hinted. Surely Dr. Hole cannot be our friend ——but, no! I will not make such a suggestion.

Another of Mr. Railton's charming studies of Westminster Abbey appears in the *Portfolio* for this month. It is the north transept that this time is the subject of the full-page drawing, and a more beautiful picture of this part of the Abbey it would be difficult to produce in the medium employed. Among the smaller drawings inserted in the letterpress are two of the interior and exterior of the triforium, the latter an admirable interpretation of the exquisite feeling in this passingly lovely production of the Early English builders. In the same number of the *Portfolio* Mr. Reginald T. Blomfield continues his eulogy of Inigo Jones and his works, illustrated by some pretty little fancies of Inigo's in the shape of triumphal arches. And there is included in this number an etching by D. T. Cameron of Perth Bridge, that shows what an artist may do even when he is, judging by appearances, in a hurry to catch the train.

The Forth Bridge is the subject of an article in the *Nineteenth Century*. It is written by the engineers, Sir John Fowler and Benjamin Baker. From it I extract the following table, which may be of interest:—

	Feet.
Two spans each	1,700
,, ,,	685
Fifteen ,,	168
Depth of main girders at piers	342
,, ,, ,, centre	50
Width of bridge at piers	120
,, ,, centre	32
Clear headway for navigation at high water	150
Deepest foundation below high water	89
Highest part of bridge above high water	360
Depth of water in centre of channel	210

An illustration shows the present state of the bridge, which will be familiar to many from the photographs recently issued; and it is hoped that by October next the structure will be sufficiently complete to admit of the passage of a train.

GOTH.

CHIPS.

The County Council for the North Riding of Yorkshire have voted their county surveyor, Mr. Waller Stead, M.Inst.C.E., an honorarium of £100 on account of the additional work thrown on him in connection with the main roads.

Extensive works of reconstruction at the Great Western Railway Station, Gloucester, were completed last week. They have cost over £20,000, and include a new up platform and greatly-needed works on the down side. Mr. W. T. Jinkin, of Plymouth, was the contractor.

A new Primitive Methodist chapel at Brampton, Hunts, was opened on the 2nd inst. It seats 120 persons, and has been built by Messrs. Page Brothers, of St. Neot's, Hunts.

The foundation-stone of the new church of Holy Trinity, Formby, near Liverpool, was laid on the 4th inst. The church will be Early English in style, and will be built of Storeton stone and Penmaenmawr granite. Messrs. Brown and Backhouse, of Liverpool, are the contractors.

The members of the Dundee Institute of Architecture, Science, and Art had an excursion last week to Rossie Priory (the seat of Lord Kinnaird), the ancient church of Fowlis—now under restoration from plans by Mr. T. S. Robertson, president of the Institute—and Abernyte Church.

The Dawson memorial high altar in St. Alban's R.C. Church, Liverpool, was unveiled last week. The altar is worked in richly-coloured alabaster, with the exception of the columns, which are of Derbyshire marble, and the tops to super-altar, which are of Malpaquette marble. The work was designed by Messrs. Pugin and Pugin, of Westminster, and executed by Mr. R. L. Boulton, of Cheltenham.

A new altar of oak with carved panels has just been placed in St. Peter's Church, Mithian, Cornwall; the work was executed by Messrs. John Symons and Sons, of Blackwater. The church is about to be restored from plans by Mr. J. Piers St. Aubyn.

The partnership between L. Oswell and P. Smith, of Shrewsbury, architects and surveyors, has been dissolved.

Mr. Jewell, builder, of Clarendon-road, Notting Hill, W., was killed by a trap accident at Oulton, near Castleford, Yorks, on Wednesday week, while on a visit to his son-in-law. His wife had both legs broken, and his daughter was injured. Mr. Jewell was 58 years of age.

The builders' labourers at Leeds have struck for an increase of ½d. per hour in wages. Several firms have resolved to pay the extra money, and the movement having spread, other men are leaving work at the end of this week if the demand is not acceded to.

On Saturday afternoon the Duchess of Albany visited Follett-street, Poplar, E., and laid the foundation-stone of the church of St. Frideswide. The building, which is being erected by Mr. William Smith, from designs by Mr. Willey, will cost about £5,000, with seating room for 700 persons.

St. Cuthbert's, Churchtown, Southport ancient parish church of North Meols, was re opened on Sunday after reseating, and the erection of a screen and organ, the latter having been built by Messrs. Foster and Andrews, of Hull, at a cost of £400.

A destructive fire occurred on Sunday night at 103, Great Dover-street, Borough, upon the extensive premises of Messrs. W. H. and F. Croker, builders. Six large buildings, of two and three floors each, used as workshops, stables, engine and boiler houses, offices, and stores, and covering an area of 130ft. by 120ft., became involved with great rapidity, and were entirely destroyed.

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ILLUSTRATIONS.

LICHFIELD CATHEDRAL.—CONVENT OF LAS HUELGAS BURGOS.—PUERTA DEL SOL, TOLEDO.—SWINDON NEW TOWN PUBLIC OFFICES.—HISTORICAL HABITATIONS AT THE PARIS EXHIBITION.—WIGHTWICK MANOR, STAFFORDSHIRE.

OUR LITHOGRAPHIC ILLUSTRATIONS.

LICHFIELD CATHEDRAL.

It appears to me that buildings never look their best without the adjunction of foliage. The rounded and irregular shapes of trees form a most pleasing contrast to the rigid lines and regular distribution of parts in architectural design. The beautiful — architectural and natural—mutually give and receive from each other, to the great enhancement of both. Many of our cathedral churches are happy in this respect. Wells, Salisbury, Lichfield, and York may all be seen with umbrageous accessories. But these foliated and best views are seen but by few, the trees being generally confined to the south-east, standing in the deanery or bishopry gardens, and the generality of visitors have not courage to seek admittance, or time for so doing. This is a pity. I am not easily turned aside when there is anything to see of interest, and have never found any difficulty in getting admission to the gardens. I advise others to seek the like favour too. Herewith I send you a view of Lichfield from the south-east. In this case I must admit that the foliage is rather overpowering, though, like the charms of Dudu,

"'Twould puzzle to say where,
It would not spoil some separate charm to pare."

—PHILIP E. MASEY.

[The following illustrations of Lichfield Cathedral have appeared in our pages:—Plan of Precincts, Nov. 21, 1879; Elevation of West Front, Jan. 15, 1886; View of West Front, July 13, 1888, and Details of the same Façade, Sept. 28, 1888; View from East, March 17, 1882; the Mortuary Chapels, March 9, 1866; some Mouldings, Aug. 25, 1871.]

BURGOS AND TOLEDO.

FOR description see page 37.

SWINDON NEW TOWN PUBLIC OFFICES.

WE can give no description of this illustration, as none has reached us. Mr. Brightwen Binyon is the architect.

EXPOSITION UNIVERSELLE, PARIS, 1889—HISTORICAL HABITATIONS.

THESE three houses, which bring the series of Historical Habitations, by Monsieur Charles Garnier, to the commencement of the 16th century, are interesting as types of small private dwellings in France from the 11th century to the Renaissance. They stand on two sides of a small public square, and almost beneath the lofty Eiffel tower. The first house, Romanesque in style (11th and 12th centuries), and its neighbour, with projecting half-timber upper stories (Moyen Age, 14th and 15th centuries), form a very piquant pair. These two houses, of a style so aptly described by Viollet le Duc in his dictionary, are perfect types of small dwellings in France during the Middle Ages; the Romanesque style, in fact, predominating in the South of France even to the 14th century. The ground plan of each consists of one room, raised, and leading directly from the street by a few steps. The third house, in the style of François I., commences the Renaissance (first half of 16th century). The large ground-floor window served for the display of Venetian glass and crystal ware. On a signboard over the doorway, between the last two houses, is written in old French, "Called to France by the noble King Henry II., the Venetian 'Verrieres' came and established themselves here in order to exercise their Art and make known the procedures." In one corner of the square is a public well with decorative wrought-iron bucket and wheel support. We are indebted for the drawing to Mr. Arthur Vye-Parminter, of Paris and Swansea.

WIGHTWICK MANOR.

No further particulars are required of this illustration, as these appeared when the first view of the house was published. Messrs. Grayson and Ould are the architects.

COMPETITIONS.

TREWTOWN, N. WALES.—In the competition for plans for the rebuilding of the Bear's Head Hotel at Trewtown the proprietors unanimously selected the plans prepared by Mr. Henry A. Cheers, of Twickenham, and have appointed Mr. Cheers architect for carrying out the works.

LIVERPOOL.—The plans of Messrs. Mercer and Alexander have been accepted in a limited competition for Sunday-school extensions and new vestry at the English Presbyterian Church, Breeze Hill, Walton, Liverpool.

CHIPS.

A new block of buildings for female patients has just been added to the county pauper lunatic asylum at Clifton, in the North Riding. The work has been carried out under the superintendence of Mr. Walker Stead, the county surveyor.

A new factory is being built at Sebastopol for Messrs. Holtzapffel, of Newcastle, London, and Cardiff, for the manufacture of paints, varnish, and their compositions for coating ships, &c. It will be the only establishment of the kind in Southern Russia. The buildings and plant are being erected from plans by Mr. Kempson, C.E., of Gateshead.

The town council of Stockton-on-Tees have raised the salary of Mr. William Ford, manager of the gasworks, from £500 to £650 per annum.

A new parish church is in progress at Ancrum, N.B., from plans by Messrs. Hardy and Wight, of Edinburgh. The building is Early Decorated in character, is cruciform on plan, and is built of local red stone.

On Saturday at the Sessions House, Newington Causeway, the Earl of Lovelace unveiled presentation portraits of Sir W. Hardman and Mr. Leycester Penrhyn, chairmen of the Quarter Sessions for the county of Surrey. The portrait of Mr. L. Penrhyn has been successfully painted by Professor Herkomer, while that of Sir W. Hardman is from the brush of Sir Arthur Clay. Both are nearly life-size, three-quarter length pictures.

New waterworks are about to be constructed at Easingwold for the rural sanitary authority, who have adopted plans and a scheme by Messrs. Fairbank and Son, of Westminster.

By the great fire which occurred on Sunday at the Russia branch of the Surrey Commercial Docks, timber and sheds worth £60,000 were destroyed, an area of 280ft. by 150ft. being laid level with the ground.

A new cricket pavilion, designed by Mr. E. H. Lingen Barker, of Hereford and London, is being built on Widemarsh Common, Hereford, the grounds of the County Cricket Club. It will be of wood, with tiled roof, and will consist of grand stand and balcony, dining-room seated for 32 persons, dressing-rooms, refreshment bar, and lavatory. On the centre of gabled roof is a clock. Mr. James Rowberry, Commercial-road, Hereford, is the builder.

The Wesleyans of Westbury-on-Trym on Saturday afternoon laid the foundation-stones of a chapel, which is to take the place of an incommodious building erected in 1810. The plans have been prepared by Mr. Herbert J. Jones, M.S.A., of Bristol; and Mr. J. Lewis, of Hotwells, Bristol, is the builder. The chapel will be of a simple Gothic design, and will have a seating capacity of 270. The schoolroom will seat 150, and there will be three class-rooms of fair size, besides the necessary offices. The whole is to be built of Pennant stone, with Bath stone dressings, and the interior furnishing is to be of pitch-pine. The expenditure is £2,600.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

ASSOCIATION OF MUNICIPAL SURVEYORS.—The annual meeting of this association was held at Portsmouth on Thursday, Friday, and Saturday in last week under the presidency of Mr. Percy Boulnois, the borough engineer of that town. The annual meeting of members was held on Thursday in the Council Chamber, Guildhall, Portsmouth, when the annual report having been adopted, it was decided, on the motion of Mr. Lewis Angell, of West Ham, "That the association be registered under the Companies Act, and that a committee of five members be appointed with full powers to carry the aforesaid resolution into effect." The president's address was then delivered, after which a paper on "The Relations of Local Authorities and their Surveyor to Improvements in the Sanitary Arrangements of existing Buildings," was read by Mr. F. Newman, borough engineer, Ryde. In the afternoon the following papers were read and discussed:—"Portland Cement," by Mr. W. Santo Crimp, A.M.I.C.E., of Wimbledon; "Sewer Ventilation," by Mr. Archibald Ford, A.M.I.C.E., of Fareham, Hants; "Improved Joints for Sewer Pipes," by Mr. C. G. Lawson, A.M.I.C.E.; of Southgate; and "Electric Lighting," by Mr. E. J. Silcock, A.M.I.C.E., of King's Lynn. The annual dinner took place at the Victoria Hall in the evening. On Friday the members visited H.M. Dockyard, seeing two ships and an ironclad and the dockyard workshops. On Saturday the party inspected the Ferrumite Works (patent paving stone) and the Portsmouth Water Company's Works at Havant, where they assisted at the ceremony of starting the new engines.

NORTHERN ARCHITECTURAL ASSOCIATION.—The annual meeting of this association was held in the Castle, Newcastle, on the 4th inst., Mr. E. J. Hansom presiding. The annual report, read by Mr. Frank W. Rich (secretary), stated that there had been an increase of members during the past session of six associates and five students. One member had resigned. The number of members at present stood as follows:—22 members, 18 associates, and 12 students. Visits had been paid by the association to the Newcastle Cathedral in June, where the members were shown over the recent alterations and new reredos by Mr. R. J. Johnson; to Stella Hall in August, where the members were received by Mr. Joseph Cowen, who personally conducted the members over the building; to the house of Mr. Alexander Shannon Stevenson, Tynemouth, in September; and to the College of Physical Science in November, where the members were conducted over the building by Mr. Johnson and Professor Garnett. The treasurer's report, also adopted, was of a most satisfactory nature. Mr. W. H. Knowles moved that Mr. Hansom be re-elected president of the association. Mr. Rich seconded the resolution, which was carried unanimously. Mr. W. S. Hicks and Mr. G. G. Hoskins were elected vice-presidents, Mr. J. Oswald was re-elected treasurer, and Mr. Rich secretary. The following gentlemen were elected on the committee:—Messrs. J. H. Morton, William Glover, Thomas Reay, T. Tillman, J. Creswell, J. T. Cackett, and W. H. Knowles.

The Right Rev. Dr. Knight, Roman Catholic Bishop of Shrewsbury, on Saturday afternoon laid the foundation-stone of a new Roman Catholic church, schools, and presbytery, in Upper Brook-street, Oswestry. The buildings, which are in the Early English style, have been designed by Mr. W. H. Spaull, J.P., architect and surveyor, Oswestry, and consist of a church to accommodate 200 worshippers, a school and school-house or convent, and then, on the south side, a house for the priest in charge of the mission.

The foundation stone will be laid to-day (Friday) of a new Congregational church, to be built at the corner of Dulwich-grove and Melbourne-grove, S.E. The church will be seated for 550 persons, and provision is made for a future extension by 350 sittings. Mr. James Cubitt is the architect, and Messrs. Everitt and Sons, of Colchester, are the builders. The outlay on the first section of the building will be £4,000.

A new Congregational chapel was opened last week at Hawkesbury, near Tunbridge Wells. It is of red brick with stone dressings, and seats 270 persons. Messrs. Potts, Sulman, and Hennings, of London, were the architects, and the contractors were Messrs. Strange and Sons, of Tunbridge Wells.

BOOKS RECEIVED.

The Law Relating to Tenement Houses and Flats for Residential or Business Purposes, by WALTER CLODE, Barrister-at-Law of the Inner Temple, A.S.I. (London: William Clowes and Sons), is a useful compilation of the law relating to this class of property, including taxation and rating, and a valuable digest of cases relating to the inhabited house duty. Chapter I. defines tenement houses and the creation of residential flats. A keenly controverted question has been the distinction between the tenant of a flat and a lodger. The former as having by agreement an exclusive possession of another's property can maintain trespass; but a lodger cannot, even when the lessor furnishes specific requirements and imposes certain restrictions. The essential character of the tenancy remains. Thus, if the lessor supplies meals and retains the key of the outer door, the occupant is still regarded as a tenant, and not as a lodger. Of course, the terms of agreement may change this relation. The consequence of this status of the tenant is that he can maintain trespass for any invasion of his right, but it renders him liable to distress, and to be rated to the poor. But the lessee takes no interest in the subjacent soil. The lessee's interests have been defined by leading cases which are epitomised. The forms of lease of tenement houses are touched upon in the next chapter. One important question is as to whether a "flat" is a "house," and the bearing upon the same of certain statutes and liabilities of the ownership. This point was decided last week in the Hammersmith Police Court, as will be seen in our Legal column, pp. 923, last vol., and 60, as to the powers of district surveyors to charge separate fees under the Metropolitan Building Acts for each set of tenements in a block of flats. It would appear that for some purposes the law calls the parts of a divided building houses; for other objects it ignores the parts, and recognises the whole as a house. This uncertain state of the law, or rather the need of a definition, is confusing, and leads to endless disputes. The author deals with each case separately, and deals with the cases of burglary and of arson; in one case the law treats the separate dwellings as houses, and in the last the whole block is regarded as the house. The right of support and the dicta of leading authorities, the tenant's right to use the staircase, hall, and passages, the landlord's duties and liabilities, and the tenant's obligations, the repairs of roof, water supply, and drainage, and other matters are discussed, and leading cases cited. The remarks on rating and the appendices are valuable. These last contain forms for different kinds of occupation, and a useful digest and table of cases are given at the end of book. Mr. Clode's work will be a welcome addition to the architect, surveyor, and estate agent's legal library. —— *Wilson's Legal Handy Books: Law of Master and Servant, Employer and Employed.* New edition. By James Walter Smith, LL.D., of the Inner Temple, Barrister-at-Law. (London: Effingham Wilson and Co.) This is another of the series of legal handy books we noticed last week. Dr. Smith, in this *résumé* of the law, sets forth the rights and duties of several classes of employer and employed, including domestic servants, those engaged in trade, tutors, and governesses. The principles and law which govern wages and dismissal, combinations among masters and workmen, arbitration of disputes, are stated, and summaries of the Conspiracy and Protection of Property Act, 1875, Employers and Workmen Act, 1875, Employers' Liability Act, 1880, the Councils of Conciliation Act, 1867, are given. The author's little book ought to be read and studied by every employer and employé.—— *Hot Water Heating and Fitting*, by WILLIAM J. BALDWIN, M.Am.Inst.C.E. (London: 92 and 93, Fleet-street), is a bulky volume describing the principles of hot-water circulation and modern heating apparatus, illustrated with diagrams. The author's work appeared in a series of articles in an engineering contemporary, which have been revised, enlarged, and thrown into a book form. Mr. Baldwin elucidates clearly the laws of hot-water circulation by showing the effect of the movement of water in a cube and cylinder heated below, and the causes which impede circulation produced by what is known as "molecular" circulation or "local" circulation. All ascending hot-water pipes have this retarding motion going on at the surface, or a descent of the heavier particles cooled by contact with the metal, and which current increases friction. This friction is found in horizontal pipes to a lesser degree, and in the downward pipes the effect of local circulation does not retard the flow. In considering the cause of circulation, the author refers to Tredgold's and Hood's theories, and considers that the water in the cold leg of the apparatus by gravity pushes the water up within the warm leg at the same time as the heat in the latter causes the water to expand. Any force that tends to destroy the equilibrium among the particles of water will cause circulation. Both heat and gravitation come into play. But to the practical engineer the inquiry is of small moment; sufficient for him to know that circulation does take place. One of the simplest and best illustrations is the endless chain over a pulley, the slightest increase of weight on one side causing the other to ascend. Chap. III. enters into the more practical question of calculating the flow of water, or the velocity of heated water in pipes. This is illustrated by a very simple experiment, and by diagrams constructed on Dalton's law. The increase of velocity of flow is small compared with the increase of height of apparatus; therefore, a low apparatus, with small difference between the temperatures of water in flow and return pipes, is better than one of great height. The author deals with other elementary matter, and shows how to find the loss of flow by friction and elbows, the proportions of pipes, &c. Describing various systems and simple circuit apparatus, several plans of buildings and diagrams of pipes are given, and various kinds of boilers and radiators are illustrated. The book will be found of value to fitters, architects, and engineers by enabling them to determine the diameters and lengths of pipes for an equal distribution, and for this purpose the tables and diagrams for ordinary practice will be found of service.——*Methods of Map Mounting*, illustrated by EDWARD STANFORD (Cockspur-street, Charing Cross), is a useful little guide to the art of map mounting. The diagrams illustrate various modes of mounting maps on spring rollers in cases and screens. In the first example we have a set of library maps, any one of which can be removed without disturbing the others. The rollers are screwed to standards fixed on the wall. Six maps thus mounted would only occupy a space of 3½ft. vertical by 6ft. horizontally. Ordnance maps or sheets can be mounted in this way singly for estate offices. Other illustrations show how single maps can be mounted on a spring roller, and made to roll up under cases. The sets of Ordnance maps, linen mounted and folding into leather or morocco boxes in the form of volumes, are valuable additions to the library of the surveyor, engineer, or the landed owner. Every public library and corporation should have a set thus preserved for reference. The "Sheridan" map screen is a compact and convenient mode for exhibiting maps.

An interesting discovery has been made at the ruins of the Cistercian Abbey of Valle Crucis, near Llangollen, where the Rev. Hugh Trevor Owen is now engaged upon some excavations. Whilst excavating along the outside wall of the north transept portions of tombstones have been discovered, indicating that the monastic cemetery was situated north of the abbey. The bases of massive buttresses in the Early Decorated style have been unearthed, and amongst the débris quantities of charred wood and molten metal have been found, proving, what has long been the theory, that the ancient abbey was destroyed by fire.

The Church of St. Theodore, Kenfig Hill, Glamorgan, has just been dedicated by the Bishop of Llandaff. Mr. Haines, of Cardiff, was the contractor, and Messrs. Halliday and Anderson, of Cardiff, were the architects. The church, which cost £850, was illustrated in our issue of March 8 last.

In the House of Lords on Tuesday Lord Brassey's Select Committee passed the preamble of the Shortlands and Nunhead Railway Bill. The Bill was strongly opposed by the London County Council. It will form an alternative trunk line to the Continent to that viâ Herne Hill and Sydenham, the promoters stating that there were difficulties in the way of doubling the existing main line owing to the Penge tunnel. The County Council opposed because the line will take a small portion of the Lewisham Recreation Ground, the railway company, however, giving a larger area in exchange. The Committee required that the public access to the grounds should not be interfered with by the railway, and that there should be no overhead telegraph wires.

Engineering Notes.

BISHOPSTOKE, HANTS.—An enlarged highway bridge is being constructed by the London and South-Western Railway Company over their lines at Bishopstoke. Messrs. Mowlem have the contract for the brickwork and masonry. Bramley Fall bedstones will be used. The foundations will be concrete, with Staffordshire blue bricks in cement on top. The copings will be of Portland stone. A pavement, 4ft. 6in. wide, laid with asphalte, will be made along the south side of the bridge. The dimensions of the new bridge will be 268ft. long, 25ft. 7in. wide; and will consist of four spans, the first one being 96ft. 9in., two of 58ft. each, and one of 55ft. 6in.

THE HAWARDEN LOOP LINE.—This railway, an important section of the new alternative railway route from North Wales to Liverpool and other parts of Lancashire, is approaching completion. The Welsh end of the railway commences by means of a junction with the existing Wrexham and Connah's Quay main line, a mile from the present Buckley station. The junction signal cabin is already erected, and about 300 yards further are the platforms of the Buckley new station, which will replace the present Buckley station. After passing the new platforms, which are faced with Buckley bricks and coping, is a cutting a mile in length, partly through fireclay and partly through rock. Having passed over several bridges, nearly all of solid masonry, the others being of iron girders, the line is carried across Tinker's Dale by a high embankment, which extends almost to Hawarden Station. On the left a glimpse of Hawarden Castle is caught through the trees. The platform walls are approaching completion. Up to this point the rails are all properly laid ready for traffic, but beyond the station gangs of men are engaged carving out a deep cutting, extending for some half a mile through sand; it will be completed and the lines laid in about another week. Between Hawarden and the Dee Bridge there are eleven bridges, all of them of a costly nature, and some of them exhibiting exceptional engineering skill. The new railway for a mile, as it approaches the Dee Bridge, will be straight. The abutments of the bridge which is to carry the line over the Holyhead Railway are built of some 300,000 Buckley bricks, with stone caps and girder beds, each bedstone weighing about 1½ ton. The girders weigh some 32 tons altogether, and these were placed in position on Sunday last. Between this bridge and the Dee Bridge, a distance of a few hundred yards only, work is progressing, and the entire line, as well as the Dee Bridge, will be opened early in September.

CHIPS.

Mr. Ruskin has just presented the Cork High School for Girls with eighteen of his original drawings to illustrate his greatest work, "The Stones of Venice," and four of the originals of the plates in the chapter on "Vegetation" in "Modern Architecture." In years to come these drawings will most certainly be worth tenfold their present value. He has also given the school a case of rare and costly minerals, stones, and gems.

The richly-carved wood screen in St. Paul's parish church, Staverton, between Totnes and Ashburton, is about to be restored at the cost of £1,000. It is upwards of 50ft. in width, and is of English oak. Mr. F. Bligh Bond, of the firm of Hansom and Bond, Bristol, is the architect for the restoration, which will be carried out by Mr. Harry Hems, of Exeter.

The Westmoreland and Cumberland Antiquarian and Archæological Society has just spent its two days' summer excursion in the neighbourhood of Penrith, under the guidance of Chancellor Ferguson, F.S.A., president of the society.

The memorial stones of a new Primitive Methodist Chapel at Steeton, near Bradford, were laid last week. The building will be of stone, and will cost over £900. Mr. H. Isitt, of Bradford, is the architect.

The new technical school for Stockport has just been completed, and Mr. G. Oscar Blacker, late of the Manchester Art and Board Schools, has been appointed head master in the department of art and design.

A London correspondent states that Mr. R. Norman Shaw, R.A., has been commissioned by Viscount Portland to design for him a new town house, based on Wolsey's portion of Hampton Court Palace.

Building Intelligence.

EDINBURGH. — Old St. Paul's Episcopalian Church, situated in Jeffrey-street, which has been in a half-finished state for some years, is about to be completed by an extension of 45ft. from the present south gable, affording about 200 extra sittings. At that end there is also provided by the plans on the east side a choir vestry on the level of the church, 23ft. by 16ft., and access will be had from it to a business room of the same size on the floor above. A baptistery will be erected on the east side of the new south entrance. Throughout the Early Pointed style of Gothic architecture of the existing building will be followed, and the new roof is to be a continuation of the present open-timber one. The cost of the work will be over £2,000. Messrs. Hay and Henderson, 12, Queen-street, Edinburgh, are the architects.

LONDON COUNTY COUNCIL. — At Tuesday's meeting of this body Mr. Joseph Gordon, of Leicester, was appointed chief engineer to the Council at a salary of £1,500 a year. The Council Chamber and Offices Committee submitted the working drawings prepared from the sketch plan approved by the Council on the 10th of May, showing how the present Council-chamber at Spring-gardens could be enlarged to accommodate the Council and provide for two additional committee rooms. The present proposition had reduced the cost to £7,500. The chairman (Lord Rosebery) doubted the wisdom of the proposed expenditure. Whatever they spent at Spring-gardens with a view to making it a permanent and suitable habitation for themselves, was money absolutely thrown away. No one was less blind than he to the terrible inconveniences under which they laboured; but he for one would prefer to labour under those inconveniences to spending money which would not be judiciously laid out. The report of the committee was, however, approved.

LONGTON, STAFFS.—The foundation-stone of a new cottage hospital was laid at Normacot, Longton, by Sir Smith Child. The designs of Messrs. Ford and Slater, of Burslem, were adopted in competition. Provision is made for 38 beds, constituting the hospital one of the largest buildings of its kind. The buildings are arranged on the pavilion principle, in three separate blocks. The centre block comprises the administrative department, from which corridors lead to the men's wards on one side and to the female wards on the other side. The ground floor of the centre block will comprise a board-room, matron's sitting-room, two rooms for a commissionaire, nurses' dining-room, nurses' and matron's bedrooms, kitchen, and stores. On the upper floor of the same block will be the nurses' sitting and bedrooms. With the exception of two private wards, all the wards will be on the ground floor. There are three general wards of eight beds each and four wards of two beds each, the last four wards being isolated from the rest of the building. Forming part of one wing is the out-patients' apartment, comprising surgery, dispensary, waiting-room, and dressing-room, and a reception-room for accident cases. The principal materials used in the construction are red bricks and terracotta, with a small quantity of stone for dressings. The wards will be lighted with windows on two sides, and the windows will be so constructed as to admit air through vertical tubes. Open fires and hot-water pipes will also be provided. The contractors are Messrs. H. and R. Inskip, and the amount of their contract is £3,359. The total cost will be something like £6,000. Mr. Thomas Blair is acting as clerk of the works.

MAIDSTONE. — The Hollingworth Brothers memorial wing of the West Kent General Hospital was opened by Princess Louise on Friday week. The various additions to the hospital have been connected with the main building, and the new wing by a new lateral corridor 100ft. in length, branching out of the main corridor to the children's wing immediately below the first flight of steps. The building is a three-floor one, and contains the following rooms for the accommodation of the nurses and the staff:—A secretary's office, day room, two nurses' dormitories, an attendance-room, and offices, these all on the ground floor. On the first floor there are six nurses' rooms, with bath-room and conveniences. On the second floor four more dormitories, with box-room, linen store, and hot and soft and hard water supplies. The architectural treatment is of simple Italian outline, the material red brick relieved with moulded strings, and a central pediment containing a plain red stone slab with an inscription. The internal fittings are of a very simple character, plain skirtings and moulded cornices only in the day room, and corridors, and hall, and all passageways and internal approaches on the ground floor are paved with wood-block paving. All floors are stained, and the walls throughout are of terracotta colour. The buildings were designed and carried out by Mr. E. W. Stephens, West Boro' Offices, Maidstone (the hospital architect). Mr. G. Chandler, of Upper Fant-road, Maidstone, was the builder.

STOCKPORT.—The old Reform Club at the corner of Lower Hillgate and Wellington-street has been pulled down, and there is being erected on its site a larger club. The principal entrance is in Wellington-street, which gives access to all the rooms in the club, and from the same street there is an entrance to the steward's department. Entering by the main doorway, a vestibule and hall 11ft. 6in. in width open on to a wide staircase leading up to the first floor. On the ground floor there are to be a reading-room, dining-room, and lavatory. Attached to the dining-room there will be a serving-room, with a lift communicating with the kitchen (which is placed at the top of the building) and also with the cellars. All the principal rooms on this floor will be 15ft. high from floor to ceiling, and the dining-room and reading-room are separated only by a movable partition. On the first floor provision is made for billiard-rooms, a card-room, a bar, and lavatories. It is proposed to warm the building throughout with hot water. The contract has been intrusted to Messrs. Robert Neill and Sons, and is being carried out under the superintendence of Messrs. J. W. and R. F. Beaumont, architects, of Manchester, by whom the plans were prepared.

CHIPS.

The foundation-stone of a new church for the parish of Norton, Malton, will shortly be laid. The old church of the parish is an unsightly edifice, and wholly inadequate to the wants of the population, which is now about 3,600, whilst the church accommodates only about 350 persons. A piece of land on Langton-road, on which the new church will be built, has been given. The new church will be a large structure in the Flowing Decorated style. The contractor for the work is Mr. S. B. Burton, of Newcastle-upon-Tyne, the clerk of the works being Mr. T. Bolton, and the architect Mr. E. Hodgson Fowler, F.S.A., of Durham. The estimated cost of carrying out the scheme is about £8,000, of which £3,000 is in hand.

Memorial stones of a new Wesleyan chapel and schoolroom were laid in Regent-street, Wrexham, on Friday. They are being built by Mr. Gethin, of Shrewsbury, from the designs of Messrs. Waddington and Sons, of Burnley, and will cost £5,800. The stonework will be carried out by Mr. James Davies, of Wrexham. The chapel will seat 640, and the schoolroom 300. There will also be four large classrooms, which will accommodate 80 more scholars. The buildings will be in the Gothic style, and have a spire 112ft. high.

The Yorkshire Archæological Society propose to hold their annual excursion at Whitby, on Wednesday week, the 24th July. Mr. St. John Hope, F.S.A., will act as cicerone on the occasion.

The Driffield Rural Sanitary Authority were occupied a considerable time on Thursday in discussing the Nafferton drainage question. Some years ago the village was drained at a cost of some thousands of pounds, but the sewage does not reach the outfall as it is only during periods of storm that any liquid finds its way to the filter-beds. The sewers having become very foul, Mr. Fairbank, of Westminster and Driffield, has been called in, and he recommends the re-laying of a considerable portion of the system. The cost will be about £500, and the authority decided to apply for a loan to that amount.

The Lord Mayor paid a visit to Stratford on Monday for the purpose of opening a swimming and other baths, which had been erected by the Carpenters' Company in Jupp-road. The swimming-bath, which was fitted by Messrs. Lund and Co., engineers, of Stratford, is upwards of 79ft. in length and 25ft. in width.

The sum of £4,700 has been raised to meet the estimated cost (£5,500) of restoring the interesting old parish church, St. Bartholomew's, Colne. The work has been commenced under the directions of Messrs. Paley and Austin, of Lancaster.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., LIV., and LV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—H. and R.—M. and P.—J. R. C. and Co.—H. W.—W. and F. B. and Co.

Correspondence.

REGISTRATION OF ARCHITECTS.

To the Editor of the BUILDING NEWS.

SIR,—In the last issue of the R.I.B.A. *Journal* reference is made to the Bill now before Parliament, and, in the course of other adverse remarks, it is said that the measure, "in the opinion of many, is intended to frustrate all that has been and is being done by the Institute to further professional education." In the same article it is alleged that the introduction of the Bill "can but be mainly intended as a demonstration of the hope, desire, or ill-will of its promoters." As I shall have no opportunity of correcting these misstatements in the *Journal* itself till August, and as copies are being forwarded to non-members of the Institute, will you allow me to reply to them in your columns, and to state most emphatically, on behalf of myself and colleagues on the Registration Committee, that the insinuations are as false and unjust as they are uncalled for? To imply that the promoters of the measure are actuated by motives of ill-will is, in the opinion of myself and very many other members of the Institute, not only of the numerous supporters of the Bill, but also of those who are opposed to it, in extremely bad taste, and is certainly utterly untrue. If there be any ill-will on either side, it is not on that of myself and colleagues, who have always striven to be courteous towards all concerned in the measure, which we certainly do hope and desire to see carried into law—a hope and desire precisely similar to that expressed by the Council of the Institute thirty years ago, when they advocated the initiation of a scheme which, in accordance with the rule established in other professions, should result in a system of compulsory examinations, extended to all architects, *whether members or not of the Institute.* The *Journal* further says, "The Institute has been for some time seriously engaged upon a comprehen-

sive scheme of education, which, when thoroughly worked and developed, will do away with the alleged necessity for registration." I and the committee I have the honour of presiding over, together with at least two thousand other architects, to say nothing of numerous members of Parliament, medical officers of health, and the general public, think differently. The *Times*, in speaking of Col. Duncan's Bill last year, said: "The Bill is not the outcome of a mere passing whim. We shall see some such project renewed, even if it be rejected this year. It rests with the older institutions to say whether the alterations which are manifestly in store for the architectural profession shall be carried out under their direction. It is not wise to say, 'The time is not ripe for so hazardous an experiment as that contemplated by Col. Duncan's Bill,' or to bid the world wait until the supplemental charter granted a year ago to the Institute has been put to the test of a few years' experience." We consider that if examinations be good for the minority of architects who seek admission to the Institute, they are good also for the profession at large, and we desire, therefore, that *all* hereafter should be tested as to their fitness before being allowed to practise, instead of, as at present is too often the case, obtaining their knowledge at the expense of their employers. No one is either legally or morally bound to join the Institute, and many most eminent practitioners are not members, something like four-fifths of the profession being independent of all societies. The general public do not know this, and I have met with many members of Parliament, barristers, solicitors, clergy, and others who have expressed the utmost astonishment on being told that anyone, however ignorant he may be, can call himself an architect, and practise as such, without belonging to any society or passing any examination, provided he can find employers. And this is not the difficult matter it would at first sight appear, as they are able to find efficient "assistants" to play the part of "ghost" at the smallest possible weekly wages, or to get *their!* designs prepared for them by really able men at a merely nominal cost, and without the slightest knowledge, thought, or trouble on their own part. Compulsory examination of all entering the profession would rid us of these vampires who are turning our noble profession into a mere trade, and living luxuriously and growing fat on the brains of their betters. The journal further says, "The objections to the Bill, which are manifold, have been formulated in various ways by the Council of the Institute"; but it does not say that although my committee, some months before its presentation, forwarded to the Council a copy of the draft, inviting criticism, in order that it might be rendered as perfect as possible, they have never to this day sent, either to myself or to my committee, the objections which they are said to have formulated. Others, however, have done so, and amendments proposed have been carefully considered, and cheerfully inserted where found to be improvements, with the result that some who opposed the former Bill have now become the warmest supporters of the measure.

It is also stated that if the Bill became law "it would open a wide door for the inclusion amongst registered practitioners of persons who could give no proof whatever of their being properly qualified." The proofs required are very much the same as those which were recently required by the Institute for the admission of Fellows and Associates—that is to say, before the examination for the latter was made compulsory. It is perfectly true that this has been the greatest objection taken to all similar Registration Bills, that you cannot get all that could be desired at the onset; but it must be borne in mind that all who are now practising as architects have a right to do so, and it would be the grossest act of injustice to deprive them of their means of livelihood, which exclusion from the register would mean, and such an act of injustice would never be sanctioned by any Parliament, for it would simply mean turning ratepayers into paupers. The registration of all has been found absolutely necessary in other similar Bills, but it has not proved to be any hardship. Very soon the incompetent will disappear from the register, and all will become qualified practitioners, as in law, medicine, &c.

In conclusion, I should like to point out that in May, 1877, at an open conference convened by the Institute to consider the subject of the registration of architects, a motion in favour was only lost by the casting vote of the chairman, and an amendment referring the matter to the consideration of a committee carried in its stead. A committee was duly appointed, and its report was submitted to the Council some twelve months ago, but this has never been laid before the members or published, though it is currently reported to be entirely in favour of the principle. If this rumour be true it is easy to understand that it would be extremely inconvenient to publish such a document whilst opposing, instead of attempting to amend, the measure now before Parliament. I may add that the Council's objections to our former Bill did not reach us till it was before Parliament. Every effort has been made in the present Bill to meet these objections, even to the exclusion of civil engineers and surveyors from its scope, but I believe it will not be long before these bodies seek registration for themselves.—I am, &c.,

HUGH ROUMIEU GOUGH.

12, Carlton-chambers, Regent-street, S.W.,

ST. ALBAN'S ABBEY.

SIR,—If the "Sheet of Contrasts" had been an illustration of any other work than St. Alban's Abbey, we should have pointed out the inaccuracies when first writing to you. Being St. Alban's Abbey, it would be a waste of time, as your columns of last week must clearly show to any unprejudiced person without going further back for evidence. It is twelve years since this great work was commenced for the Restoration Committee, and for the last nine years it has been carried on by Lord Grimthorpe. Is it presumption on our part to think that we, who, during that long period have had daily knowledge of all that has been done, *must* know something of what was and what is at St. Alban's Abbey? Who is most likely to be correct—we who have carried out the work, or "Goth" *who acknowledges he has not seen it?* Let "F.R.I.B.A." hug himself with delight by all means at the idea that you have given us "what for." But why, Sir, should you give us "what for" (whatever that may be) for simply making a perfectly true statement? Neither you, Sir, nor "Goth," nor "F.R.I.B.A.," nor any of your correspondents, so far as we have seen, have challenged Mr. Roumieu Gough's description of "the ancient painted ceiling." The members of the St. Paul's Ecclesiological Society heard it so described with a piece of it before their eyes. Yet no one has thought fit to correct so palpable a misrepresentation, and this is only one of many. So numerous are they that to give a detailed refutation would need a volume, and so absolutely untrue that nothing but wilful misrepresentation, or the most utter ignorance, can account for them. However, "Goth" says he is contemplating a visit to the Abbey, taking the drawings with him, and "should there be any misrepresentations he will be the first to declare them." So be it; but to save "Goth's" time searching for "one or two trifling details that have been drawn inaccurately," we beg to assure him the inaccuracies are *not* "trifling details." We have only to add that it is absolutely false that "Mr. Longmire fastened up the gateway by Romeland himself just before the visitors came round;" and in case "Ars" cannot inform "A. S. S." and your readers generally "why it was that Lord Grimthorpe's men put all sorts of impediments in the way of the St. Paul's Ecclesiological Society's members seeing all the Abbey during their late visit," we can. The St. P. E. S. visited the Abbey on a Saturday afternoon, and, as most people know, the British working man leaves off work at mid-day on a Saturday, and, naturally, the men not being at work, the works were locked up. Anywhere else this simple explanation would have been apparent; but the men were "Lord Grimthorpe's men," and the work was Lord Grimthorpe's, therefore, the men leaving off at their usual time, and the works being locked up as usual, is distorted into "all sorts of impediments" in the way of the Society. Is it possible that the St. P. E. S. and "A. S. S." imagine that Lord Grimthorpe would pay us for keeping our men after their usual time for the sole purpose of waiting upon a party of gentlemen spending an agreeable afternoon in displaying their great knowledge of architecture, sculpture, painting, and "jerry building"? It is absurd, and almost tempts us to end our letter as "A. S. S." does, with a joke; but we forbear, and subscribe ourselves—Yours, &c.,

WM. LONGMIRE AND CO.

SIR,—Permit a visitor within the last few days to the above to emphasise all that is said in the current week's issue relative to the destruction that is going on at the present moment at St. Alban's Abbey. Workmen are now destroying the masonry of the large east window, and the most westerly of the clerestory windows on the north side has gone, and a window of entirely different character is being substituted in its stead. One of the workmen to whom I spoke showed me stones in preparation for the other clerestory windows, the *whole of which*, I understand, are doomed, and in a few short weeks will be no more! I found it impossible to examine Sir Arthur Blomfield's work on the high altar screen, however, as Lord G.'s people have, by hoardings, practically excluded it from the public eye, and in front a board is placed, upon which is the following inscription:—

"NOTICE.

"The contractors will not be responsible should any accident occur to persons visiting this part of the abbey during the progress of the works.

"WILLIAM LONGMIRE AND CO."

Remembering that in the late Mr. Chapple's time the names of the contractors were Messrs. Longmire and Burgh, and that the first of these gentlemen died about the same time that Mr. Chapple did, I naturally inquired who Messrs. Longmire and Co. were, and was told that locally it was understood that the first was young Mr. Longmire, and that the "Co." was no less than the big Lord G. I simply give this as it was told to me; perhaps "Ars" can enlighten us further.

Of course, as everybody knows, the real man who is carrying out the practical part of Lord Grimthorpe's work is Mr. Brown, a thoroughly competent foreman, for any work under the supervision of an architect. But it is quite a different thing for an honest, all-round foreman to find himself in one of our most interesting cathedrals and ordered to spend thousands (£60,000, "Ars" says) with no architect at his back!

Of course, I went round to the west end, and saw that statuesque curio of Lord Grimthorpe. "Ars," in one of his letters, if I recollect rightly, says other people have sought immortality in the same odd fashion; but surely it has been left to his lordship to select to be carved as an angel—whiskers and all!

One day, so the story goes, when Lord G., in his dogmatical manner, told Sir Arthur Blomfield that he did not believe in angels, the accomplished architect in question retorted drily, "It doesn't matter whether you do or not, you'll certainly *never see one!*"—I am, &c.,

A VISITOR TO ST. ALBAN'S.

SIR,—No sooner is one writer floored than another crops up, reiterating the same things against me, apparently without reading my letters, and calling me "untruthful" because they themselves misrepresent what I said! The clerestory windows are coming out to save themselves from falling—they are the poorest of Late work in church, and set in a wall thickened out without bonding, and capped by a course of brown clay! That is enough for "F.R.I.B.A."

"A. S. S."—ominous suffix—says my first letter was "most aggressive," showing that he never saw it. In one thing only is he right, that St. Patrick's, Dublin, is as bad as can be. If he will find anything "untruthful" or "unveracious" in my letter, I shall be glad to withdraw it. My only slip was about the Chester cloisters, which I at once admitted. Not one of your many correspondents has had the good manners to do likewise.

Mr. Steinmetz's sketches are notoriously (as I said) fancy sketches, wrong in detail and measurement. As to one of them, let me repeat my original and unanswerable proposition, that Scott rebuilt the south aisle vault without providing adequate support for it.

I take the Bishop of St. Alban's opinion for little worth, after the Felstead school incident. If he calls the nave pulpit a "rotunda" (what a lame excuse for not preaching in his cathedral!) so do other people call Mr. Gough's in St. Cuthbert's a "sauce-boat," which it much resembles. Of "Mr. C. Brown, F.S.A.," I know nothing.

My friend Mr. Chester is a great authority on *scarabæi* and the "unspeakable Turk." What is his Egyptian knowledge to St. Alban's? Your very veracious "A. S. S." invents my abuse of Abbot Wallingford's work. I never said a word

against it; but I do fearlessly say that Wallingford never contemplated such sculptures as now fill his niches—the restoration of which by Sir A. Blomfield was a mere trifle. As I said long ago, I never heard an artist say a good word for them; the photos were enough for Dean Kitchin, and there are people about the Abbey who have reason to regret that the sculptor's family ever came there. When I spoke of really excellent modern works at Cork and Salisbury, I was pooh-poohed by people who have never seen them. Lord Grimthorpe never praised the statuary; and why quote his opinion that all your correspondents have been saying is worthless? All I said about Chapple is *perfectly true*, as Lord G., Mr. Longmire, Mr. Brown, and others can testify. If the one bay on the north side cost Lady Salisbury and her friends £200, it is quite certain that the work on the south and east sides of the choir-aisle and ante-chapel could not have been done for three times the money. Mr. Gibbs may have paid £365 for part of it (of which I never heard before); but that left Chapple some hundreds of pounds out of pocket for the rest. And this very elaborate work (which some one in the BUILDING NEWS denounced as a mixture of 14th-century and Tudor work) seems to have been designed by Scott!

Yes, Sir, I *am* anxious to impress the world with the fact that Lord Grimthorpe has expended, not sixty, but above eighty, thousand pounds on his ruinous cathedral since 1880, and that no such extensive work has been done with so few mistakes, nor by an individual anywhere else in Great Britain. What is Mr. Gibb's paltry £5,000 in six years to this? I can fancy professional fingers itching for the handling of such a sum, especially after lately seeing the monstrous claim of Mr. Sedding on the D. and C. of Winchester for the completion of the fabric of their great screen, a work which their own staff carried out for little more than a third of Mr. Sedding's estimate. By the bye, Mr. Gough and "St. Alban" denied flatly that Mr. S. was the Winchester architect at all! As to all-round hitting, if people attack they must expect to be answered. Those who made a joke of Lord G.'s face appearing in the west porch forgot that Mr. Gibbs's is to be found on the screen. And it is not altogether malapropos to mention that the clever architect of this large house, where I am writing this, led his hot-water heating pipes through the *larder!* As I don't even know where "Romeland" is, I can answer for nothing Mr. Longmire did there; but I do know that that old slype door is not Norman, and that the ironwork—*not* 12th century, and as thin as a shilling—is carefully preserved. Had I been near London, and had notice, I should have taken care that the St. Paul's Ecclesiological Society heard the other side of the case, and that the history of the west bay of nave was explained to them. No one seems to have known any more about it than they did of Lincoln or Chartres when they foolishly said the north window of St. Alban's was made of Jubilee coins.

In conclusion, let me say that anyone who accuses me of toadying Lord Grimthorpe, or anybody else, can only fitly subscribe himself an

A.S.S.—I am, &c.,

July 8. ARS.

AN EVIL SYSTEM.

SIR,—Your correspondent is quite right, and I am not sure but that one could go a great deal further and say a great deal more on the subject.

The jerry builder is certainly a bad lot; but how about the so-called contractor? Is he not a "good" second, if not an equal? A partial remedy for this could be found in the introduction of a "Lien Law," similar to that which exists in some of the United States of America. I say "some," because it is not universal. The National Builders' Association of America have been lately occupied in a long discussion on the matter, and advocate a general law throughout the States.—I am, &c., STANLEY G. BIRD.

KINGSTON-ON-THAMES SEWAGE.

SIR,—I have read with interest the particulars of the sewage-disposal works, as described in the BUILDING NEWS of Saturday last. There is only one point upon which, with your permission, I should like to have more information—that is, as to the value of the pressed sludge. It is "said" to sell for £3 10s. per ton. Well, I should be glad to have this verified more in detail. I do not mean as to the sale of a few tons here and there to be used experimentally, but as an ordinary and regular sale price. My own estimate would be less than half the amount stated, and at that price I should expect great difficulty in getting rid of it. Perhaps in the dry and compressed state it may be worth more than I have stated. However, I should be glad to know the facts. So much has been said as to the value of sewage sludge, and so very little actually realised, that it is of importance to have actual and not experimental results.—I am, &c.,

C. E.

[This, of course, is *the* point in all such schemes. We gave the figures as given to us; but our own opinion inclines considerably towards the figure quoted by "C. E.," and even at that price there is difficulty in many cases in insuring a steady and regular disposal of the solid refuse.—ED. B.N.]

J. L. BACON AND CO.

SIR,—We observed in your last issue a notice of the dissolution of partnership in this firm. This, however, may give a wrong impression, as it does not state that the firm will be carried on as before by our Mr. Palmer Dalton.—We are, &c.,

J. L. BACON AND CO.

34, Upper Gloucester-place, Dorset-square, London, N.W., July 8.

Intercommunication.

QUESTIONS.

[10030.]—**Damp-proof Course.**—I have a building in course of erection, and I find that the builder has not laid the damp-proof course with the material specified, but with a material that I have very little faith in. The builder says that he will not alter it, as he considers it better than that specified. What should I do in this case? I take it that the contractor has no right to alter the materials without the consent of the architect, and if he does so, and the architect objects, he must execute the work according to the specification.—DURHAM.

[10031.]—**Extras and Deductions.**—Has there been any legal decision in the question of contracts (extras and deductions) since "Richards v. May," 1883, in which case the architect's decision was ruled by the judge as binding. I am interested in a matter where the owners' architect has left this country, and, although his decision was declared to be final in the contract, no mention was made with reference to the price of extras and deductions. The owner now declines to pay the amount due to the builder for extras. Perhaps you could refer me to a later decision in a somewhat similar case.—J. C M.

[10032.]—**Vitriol Store Floor.**—Would some reader kindly give me their opinion what kind of a mastic would be most durable for this floor, with proportions and particulars in mixing? Full particulars will oblige.—E. X. D.

[10033.]—**Facing Bricks.**—Can any of your numerous readers inform us if it is possible to obtain facing bricks to be mixed with sugar in the making, as we have an inquiry for a quantity, and the party wishes us to make them and mix the clay with sugar—a pound of sugar dissolved in a gallon of water—but does not give the quantity of clay that has to be mixed with this? We have our doubts if they can be burnt, as we are afraid they will be likely to run in the burning. Anyone who can give us some idea of the mixing and mode of burning, if those bricks have ever been made, will relieve—SUGAR BRICKS.

REPLIES.

[10018.]—**Sound Passing Through Walls.**—My attention has only just been directed to the attention of "E. A. T." in yours of 28th June. It is well established by experience that the best mode of preventing the transmission of sound through walls or partitions is by applying that glass-like fibre produced from blast-furnace slag, and known throughout the building trade as "silicate cotton." This material is also fireproof, and prevents the ingress of vermin.—M. H.

[10023.]—**Sketching Block.**—"A Pupil" should stretch his paper on a board in the usual way before cutting to the required sizes. The sheets should then be placed on a millboard back, with a heavy weight the same size on top, and linen and glue used for the edges. Care must be taken that the weight used is sufficient to press the sheets tightly together, and stop the glue getting in between. But if "A Pupil" takes my advice, he will buy his blocks, as they are sold much cheaper and better made than he will be able to turn them out.—J. W. F.

[10024.]—**Commission on Restoration after Fire.**—It is more satisfactory to charge by time in such matters, as it is obvious that there might be as much work and expense in a £500 matter as in one of £4,000. I know of no method of charging by commission, at least, I have never done so myself.—H. L.

[10025.]—**Right of Light.**—Assuming that the window has been completely blocked up for twenty years, the owner of the building C can raise his building and build in the sill and cornice: he need not cut them off.—H. L.

The name of E. E. Moore, of Mecklenburg-square, W.C., architect, appears in Tuesday's list of adjudications in bankruptcy.

LEGAL INTELLIGENCE.

BREACH OF BUILDING BY-LAWS.—At the Court-house, Harrogate, on Monday, Mr. James Chippendale, builder, Mr. James Whitesmith, Mr. Ward, and Mr. James Whincup, all of Harrogate, were charged with allowing certain houses to be occupied without first having obtained a certificate from the corporation in accordance with the printed by-laws of the borough. The borough surveyor proved the charges. Mr. Chippendale pleaded not guilty, and stated that the late borough surveyor (Mr. Harry) inspected the houses mentioned. He applied for a certificate, but had never received it. The case was adjourned in order to communicate with the late surveyor. The other defendants pleaded guilty, with extenuating circumstances. The Mayor said the defendants must pay the costs in each case, and, with that understanding, no penalty would be inflicted. Although there had been some laxity in the past with regard to the by-laws, henceforth the building by-laws would be strictly enforced.

DISTRICT SURVEYORS' FEES FOR FLATS.—At Hammersmith, Mr. Curtis-Bennett gave his decision on the 4th inst. on an adjourned summons against Mr. Frederick Shingleton in respect of fees claimed by Mr. T. E. Knightley, district surveyor of Hammersmith, for supervising the erection of a building called flats. The case was reported in our issue of the 28th ult. (p. 923, last Vol.) Mr. Knightley held that he was entitled to charge a fee for each flat, on the ground that they were separate buildings according to subsection 1 of the Act. The defendant however, argued that they were not separate buildings, and that the surveyor should have calculated his fees for one only. It was also suggested that the Representation of the People Act applied, but the magistrate was of opinion that it did not. He thought the case did not come within either subsection 1 or subsection 3, for the reason that there was only one staircase and only one entrance from without. He was of opinion that subsection 2 applied, sets of chambers and flats running on the same party rules, and that Mr. Knightley was only entitled to charge for one building. A certain amount of the claim had been paid, which according to Mr. Curtis-Bennett's decision was in excess of the demand, and he expressed doubts whether the defendant had any legal remedy to recover it from the complainant. The defendant, in asking for costs, said no other surveyor in London had made such a claim. Mr. Moseley, the district surveyor of Fulham, said Mr. Paget had held that each flat was a separate tenement, a notice being required for each. Mr. Curtis-Bennett said he would not go into that matter. With regard to the application for costs he adjourned the summons to give Mr. Knightley an opportunity of returning the excess, which he thought he would do after hearing his expression of opinion. If he returned the money he would not grant costs, but if he did not, then he would consider the defendant's application.

THE EMPLOYERS' LIABILITY ACT.—IMPORTANT DECISION.—(Before the West Kent County Court Judge, Mr. Homersham Cox.)—At Dartford on Tuesday, an important action involving the responsibility of contractors under the Employers' Liability Act came on for hearing under an order from the High Courts for a new trial. The plaintiff, James William Penfold, a carpenter, claimed £25 for injuries received by him whilst working for Mr. William Johnson, contractor for the erection of the small-pox convalescent hospital, which the Metropolitan Asylums Board are erecting at Darenth. The plaintiff was engaged in the fixing of wooden brackets into uprights, and he alleged that the brackets were not bolted to the uprights, in consequence of orders given by a Mr. Woolley, whom it was contended was "a person superintending the work on behalf of the defendant." One of the brackets fell out, and struck the plaintiff's head so severely as to render surgical treatment necessary. For the defence, Woolley was called, and said he was merely a journeyman working at 8d. per hour, and was not authorised to give any orders. He gave no orders about the bolting of the brackets. John Gerrard, the foreman, said he gave no orders for the uprights to be erected without being bolted. The jury at once returned a verdict for the defendant, on the ground that there was no negligence on the part of the person having the superintendence of the work; they also found there was no defect in machinery or plant.

Additions are about to be made to the library and museum buildings at Trinity College, Dublin. Mr. Thomas Drew, R.H.A., of Dublin, is the architect, and Messrs. S. Bolton and Sons are the contractors; the outlay will be about £1,760.

Mr. J. W. Start, of Cups Chambers, Colchester, has been appointed architect to the Wyvenhoe School Board, recently formed. The schools are to accommodate 670 children. The buildings are to be detached, and to include residence for master and two residences for mistresses. A capital site has been secured, running parallel with the G.E.R. to Clacton and Walton-on-the-Naze.

Our Office Table.

A BILL introduced by Mr. O. V. Morgan, member for Battersea, to enable the County Council to purchase, by agreement, the rights of the London Water Companies, has been read a first time in the House of Commons. It authorises the Council to borrow the money required by creating fresh Stock, under the Metropolitan Board of Works (Loans) Acts, 1869 to 1875, redeemable within sixty years. After payment of the expenses and dividends of the Stock, the profits are to be applied in reducing the charge to the consumers of water, or, on the vote of the Council in any year, in reducing the Metropolitan consolidated rate. The Bill is endorsed by Messrs. O. V. Morgan, Beaufoy, Buxton, Cremer, Howell, Lawson, Montagu, Pickersgill, Rowlands, and James Stuart.

THE following awards of prizes and certificates have been made at University College, London, in the class of Architecture, conducted by Professor T. Roger Smith:—Fine Art Donaldson Silver Medal, H. P. Adams, of London; 2nd prize, E. C. Finch, of Roehampton; certificate, 3*, Louis Jacob, of New Cross; second class, J. P. Cooper, of Leicester, E. B. Hoole, of London; third class, K. Sakurai, of Japan, A. G. Salmon, of London. Construction: Donaldson Silver Medal, P. S. Worthington, of Alderley Edge; 2nd prize, S. A. Lang, of Clifton; certificates, 3*, A. G. Salmon, of London; 4*, A. G. Robertson, of Cheltenham; 5*, W. W. Hind Smith, of London; second class, H. P. Adams, of London, V. H. King, of London; third class, C. W. Dawson, of Croydon, E. Cubitt Nichols, of London, Tokitaro Okada, of Japan. Modern Practice: Prize, Walter Taylor, of Headingley; certificate, 2*, Harry Sirr, of London; second class, H. P. Adams, of London, S. C. Arding, of Upper Tooting, Sidney Mart, of London, Jas. Simpson, of London, P. S. Worthington, of Alderley Edge; third class, E. C. Finch, of Roehampton, F. W. Fryer, of Beckenham, H. B. Young, of Slough. The asterisk indicates that the candidate obtained the number of marks qualifying for a prize.

IN our notice of the Kingston-on-Thames Sewage Works last week, we omitted to say that the old scheme of sewerage adopted 25 years ago was on the gravitation system, the sewage being collected in a culvert 4ft. diameter, which discharged it in its noxious raw state into the Thames. The inhabitants down the river would not tolerate this plan, and protested. An irrigation scheme was then thought of, but the cost and difficulty of acquiring land near were too great, and the riverside populations had good ground for opposing this measure. Under these circumstances, the A B C process of the Native Guano Company was adopted, with the results we have described.

CHIPS.

The Mayor of Worcester, Mr. Ernest Day, M.S.A., entertained about 230 guests, representative of the county, on Monday week at the Guildhall in that city. The guests included Mr. W. H. Seth-Smith, the late President of the Society of Architects.

The Mayor of Croydon, Mr. J. W. Hobbs, opened, on Wednesday, a new recreation ground at South Norwood, which has been purchased and laid out by the corporation at a cost of nearly £6,000. The recreation ground covers an area of 12½ acres, and is in close proximity to Norwood Junction. Croydon now possesses eleven public open spaces.

The Town Council of Leeds adopted on Tuesday a scheme by Mr. T. Hewson, the borough and waterworks engineer, for stopping the leakage at Eccup reservoir. The scheme was submitted to and approved by Mr. G. H. Hill, of Manchester, the engineer to that corporation for the Thirlmere water supply works. The estimated cost is £15,000.

Mr. Henry Richards, C.E., of Kingston-on-Thames, and 51, Grosvenor-road, S.W., has unanimously been elected chief surveyor to the Mortlake District Highway Board, in place of the late Mr. J. C. Medworth, who died at the advanced age of 85 years.

The redecoration of Drury-lane Theatre has been commenced this week, Mr. Augustus Harris having intrusted the work to Mr. J. M. Boekbinder.

The new Scottish National Portrait Gallery will be opened on Monday next.

WATER SUPPLY AND SANITARY MATTERS.

PRESTON.—Mr. Arnold Taylor, a Local Government Board inspector, held an inquiry on the 3rd inst. at the town-hall, Preston, respecting an application by the Preston Town Council for power to borrow £130,000, of which £115,500 is for a sewerage scheme and £14,500 for a refuse destructor with cremators attached. The proposals were practically unopposed. The borough engineer, Mr. H. Reah, explained the sewerage scheme. At present the sewage passes into the river Ribble through a low-level sewer, which is tide-locked and otherwise objectionable. A new low-level intercepting sewer is proposed, the existing main sewers below certain points being retained as overflow and storm-water culverts only. The low level of the main sewers will render it necessary that the sewage shall be lifted in order to deliver it at a higher level on the farm at Freckleton on the Ribble, purchased in 1883 by the corporation. This lifting is to be performed by Shone's hydro-pneumatic system, provision being made for lifting 12,000,000 gallons per day. The ordinary dry weather discharge of sewage is 3¼ millions of gallons daily, and it is not proposed to admit more than six gallons of storm water into the sewers. The ejectors are worked by compressed air, and the steam for the engines will be generated by the heat which is produced in the proposed destructor. Freckleton farm consists of 500 acres, and is about eight miles down the river from Preston. The present population of Preston is 104,200, and there is an arrangement with the Fulwood Local Board to take into the new system the sewage of Fulwood.

On Saturday the foundation-stone was laid of a new church for the West United Presbyterian congregation on Ettrick-terrace, Selkirk. The style is Scottish Gothic of the Early Decorated period. Internally the church is divided into a nave and side aisles, and at the south end the choir and organ-chamber form a chancel-like continuation. The tower, which is massively treated, rises to a height of 100ft. above the roadway. The church is seated for 700, and the two halls adjoining will seat 490. The architect is Mr. John B. Wilson, Glasgow.

Two public parks were opened on Saturday at Middleton, near Manchester. One is a gift from Lord Brassey, and the other is a purchase by the corporation. The ground given by Lord Brassey amounts to about five acres; it is part of the rising ground at Barrowfields, on the north side of the town. The second park cost the town £2,400, and is three acres in extent; it lies between the parish church and the Old Boar's Head Inn.

Holloway's Pills.—The balsamic nature of Holloway's Pills commends them to the favour of debilitated and nervous constitutions, which they soon resuscitate. They dislodge all obstructions, both in the bowels and elsewhere, and are, on that account, much sought after for promoting regularity of action in young females and delicate persons.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

AMMANFORD.—For house and shops, for Messrs. John and Price, the Stores, Ammanford. Mr. D. Jenkins A.R.I.B.A., M.S.A., Llandebie and Llandilo, architect:—
Estimated cost £1,000 0 0
Carried out by the proprietors.

AMMANFORD.—For house at Bettws, for Mrs. Rees, Bettws. Mr. D. Jenkins, A.R.I.B.A., M.S.A., Llandebie and Llandilo, architect:—
Davies, T., Llanstephan (accepted) £270 0 0
Griffiths, T., Bettws 252 0 0

ANGLESEY.—For alterations and additions to Uxbridge House, Anglesey, for Mr. S. T. Blake. Mr. W. Yeardye, Gosport, architect:—
Lear, C., and Son, Alverstoke (accepted) ... £500

BATTERSEA.—For painting and decorating the Mason's Arms Tavern and the Rock Tavern, York-road, Battersea, S.W., for Mr. E. Purchase. Mr. H. L. Newton, 49, Victoria-street, Westminster, architect:—
Burman, Sharstead-street £365 0 0
Walker, Gough-street 360 0 0
Godden, 43, Upper George-street ... 350 0 0
Jones, J., 40, Sydney-street, Chelsea 309 0 0
Lamble, 12, Chichester-street, W.... 245 0 0
Smith & Son, Belgravia (accepted)... 232 0 0

BATH.—For the reconstruction of a sewer in Beaufort-buildings East, for the city council:—
Jennings, E. (accepted).

BLANDFORD.—For alterations and additions to the police station, for the Dorset county council:—
Brickell, R. W., Shaftesbury (accepted) £375 18 3d.

CAMBERWELL, S.E.—For the supply of 80 fathoms of wood, for the Camberwell board of guardians:—
Wilson and Watson £473 6 8
Jewett, G. 460 0 0
Davies, J. and G. W. 440 0 0
Hill and Record 420 0 0
Highland, G. E. (accepted) 418 0 0

CAMDEN TOWN.—For new business premises, for Mr. J. Perriman. Mr. R. J. Beale, A.R.I.B.A., Palace Chambers, Westminster, architect. Quantities supplied:—
Hart, P., South Tottenham ... £2,173 0 0
Voller, F., Wood Green 1,958 0 0
Eaton & Co., Whitechapel* ... 1,955 0 0
Dixon, J. W., Highgate 1,949 0 0
Killingback, C., Camden Town ... 1,938 0 0
Scrivener, W., Camden Town ... 1,938 0 0
Drew, A., Camden Town 1,883 0 0
Patman & Fotheringham, Theobald's-road, W.C.... ... ... 1,873 0 0
Macfarlane Bros., Hornsey-road... 1,859 0 0
Gould & Brand, Camden Town ... 1,847 0 0
Goodman, W., Hartham-road, N... 1,843 0 0
Beale, J., Westminster 1,783 0 0
Toms, E., Camden Town 1,768 0 0
Dabbs, W. M., Stamford-hill ... 1,729 0 0
Lamble, S. R., Kentish Town+ ... 1,621 0 0
*Too late. +Accepted.

CATERHAM.—For the execution of work of painting and cleaning at the asylum:—
Batchelor, M., Maidstone (accepted) £468 10 0
(Seven tenders received).

CHALFONT, ST. GILES, BUCKS.—For pulling down and rebuilding the Three Horse Shoes, Seer-green, for Messrs. Salter and Co., Rickmansworth. Mr. C. P. Ayres, 52, High-street, Watford, architect:—
Brown and Sons, Harefield £620 0 0
Bates, J., Chorley Wood 610 0 0
Darvell, G., Chorley Wood 609 8 0
Darlington, G., Amersham 530 0 0

CHELSEA.—For cleaning and whitewashing the Chelsea Infirmary:—
Jones, H., Uxbridge-road £825 0 0
Burbidge, T., Sydney-street, Chelsea 395 10 0
Leggett, J., 1, Britten-street 395 0 0
Eades, W., 20, Coulson-street ... 300 0 0
Housego, J., 103, Sydney-street ... 297 0 0
Griffiths, J., Park Walk 296 0 0
Steel, T., 112, King's-road 289 0 0
Mason, R., 31, Milman-street ... 286 0 0
Jones, J., 40, Sydney-street, Chelsea 286 0 0
Stewart and Co., Walworth... ... 285 10 6
Simmonds, J., Thornton Heath ... 270 0 0
Wade, G., 24, Flood-street 267 0 0
Foxley, G., Regent-street 230 0 0
Searle, G., 119, College-place ... 226 10 0
McCarthy, 12, Oakley-street* ... 220 0 0
Andrews, W., Stroud Green 189 10 0
Leathermore, Tulse-hill 189 0 0
*Accepted.

CHELSEA, S.W.—For the enlargement of the new school in Hatford-road, Chelsea (now in course of erection), from 998 to 1,198 school places, for the London School Board:—Hart Bros., Great Dover-street, S.E. (accepted) £866 3 5
(Messrs. Hart Bros. are the contractors for the school now in progress.)

CREDITON, DEVON.—For the erection of a school at Hookway, for the Crediton School Board. Mr. C. Cole, Queen-street Chambers, Exeter, architect:—

Berry, W. B., Crediton	£1,350 0 0
Westcott, J., Exeter	1,325 0 0
Steer, J. L. & H., Clyst St. George	1,228 0 0
Ham and Pasmore, Exeter	1,190 0 0
Brooks, J., Crediton	1,071 0 0
Jones, T., Crediton*	1,063 0 0

*Accepted provisionally.

DARENTH.—For the erection of six fire escape staircases and other works at the Asylum for Imbeciles, Darenth, near Dartford, Kent, for the Metropolitan Asylum Board. Messrs. A. and C. Harston, 15, Leadenhall-street, E.C., architects. Quantities supplied:—

Jerrard	£2,649 0 0
Gentry	2,579 0 0
Wall Bros.	2,536 0 0
Johnson, W.	2,470 0 0
Holliday & Greenwood (accepted)	2,077 0 0

DYMCHURCH.—For the construction of three groynes, west of Dymchurch, for the bailiff and jurats of Romney Marsh:—
Martin, Lydd (accepted) ... £523 0 0
(Lowest tender received.)

GRIMSBY.—For the enlargement of the South-parade board schools:—

White, J.	£1,098 0 0
Thompson, J. M., and Sons	1,049 0 0
Porcass, H.	988 0 0
Guy, J.	980 0 0
Marris, H.	940 0 0
Siminson, T.	927 0 0
Chapman, J.	925 0 0
Grant, F. (accepted)	873 0 0

HOMERTON.—For painting and repairs at the Eastern Ambulance Station, Brooksbys-walk, Homerton, for the Metropolitan Asylum Board. Messrs. A. and C. Harston, 15, Leadenhall-street, E.C., architects. Quantities not supplied:—

Bax	£136 9 0
Wales and Co.	111 12 0
Ivory, I.	95 0 0
Polley and Co., 17, Brownlow-street, Dalston (accepted)	92 0 0

ISLINGTON.—For alterations at the Star and Garter p.h., Caledonian-road, N. Messrs. Wilson, Son, and Aldwinckle, architects:—

Toms, E.	£3,728 0 0
Ashby and Horner	3,344 0 0
Hearle and Son	3,130 0 0
Shurmur, W.	3,060 0 0
Mills, J.	2,750 0 0

LEEDS.—For classroom alterations at Leylands School, for the Leeds School Board:—
Craven and Umpleby (accepted) ... £70 19 0

LIVERPOOL.—For forming and making up the carriageway of Mather-street, for the city council:—
Chadwick, W. F., Liverpool (accepted) ... £164

LLANDILO.—For house, for Mr. W. Griffiths, merchant (stones, brick, and sand supplied). Mr. D. Jenkins, A.R.I.B.A., M.S.A., Llandebie and Llandilo, architects:—

Thomas Brothers, Llandilo	£940 0 0
Evans, W., Carmarthen	849 0 0
Williams, J. O., Knighton	760 0 0
Jenkins, B., Brecon (accepted)	735 0 0

LLANDILO.—For house, for Mr. W. Griffiths, merchant (stones, brick, and sand supplied). Mr. D. Jenkins, A.R.I.B.A., M.S.A., Llandebie and Llandilo, architects:—

Evans, D., Llandilo	£600 0 0
Perkins, J. A., Llandilo (accepted)	491 0 0

LLANELLY, CARMARTHENSHIRE.—For the erection of the Higher Grade Schools, for the Llanelly School Board. Mr. E. H. Lingen-Barker, architect:—

Davies, D., Llanelly	£5,446 0 0
Bassett, J., Llanelly	5,361 0 0
Jenkins Bros., Swansea	5,019 0 0
Thomas, Watkins, and Jenkins, Swansea	5,000 0 0
Smith, H., Kidderminster	4,979 0 0
Stephens and Bastow, Bristol	4,849 0 0
Williams, T. D., Knighton	4,840 0 0
Hopkins, J., Cardiff	4,817 0 0
Hughes, D., Llanelly	4,800 0 0
Mercer, G., Llanelly	4,700 0 0
Williams, D., Llanelly	4,477 12 0
Inwood, J., Worcester	4,350 0 0
Brown, Thomas, & Johns, Llanelly*	4,350 0 0

* Accepted.

LLANNON.—For repairs to Rhydycerrig, for Mr. M. Jones. Mr. D. Jenkins A.R.I.B.A., M.S.A., Llandebie and Llandilo, architects:—

Davies, J., Morfa	£110 0 0
Peregrine, R., Bethanier (accepted)	105 0 0

LONDON.—For works at No. 10, Adam and Eve-court, Oxford-street, for Mr. Busy. Mr. J. Fowle, 64, Fulham-road, S.W., surveyor:—

Colwill, J. B.	£339 0 0
Philpot and Son (accepted)	285 0 0
Reeves	279 0 0

Surveyor's estimate, £320.

LONDON, N.—For decorative repairs to Nos. 15 and 17, Cornwall-road, Stroud Green, N., and to No. 255, Upper-street, Islington, for Mr. A. Pitt. Mr. E. J. Harrison, 72, Chancery-lane, W.C., architect:—
Fernley, J. H. (accepted) ... £75 6 0

LONDON, N.—For decorative repairs to No. 13, Clifton-road, N.W., and No. 9, Lucerne-road, N. Mr. E. J. Harrison, 72, Chancery-lane, W.C., architect:—
Fernley, J. H. (accepted) ... £71 10 0

LONDON, N.—For alterations and additions to Nos. 42 and 43, Upper-street, Islington, for Mr. W. Huntsman. Mr. E. J. Harrison, 72, Chancery-lane, W.C., architect:—
Drew and Cadman (accepted) ... £490 0 0

MANSFIELD, NOTTS.—For the erection of fifty cottages at Langwith colliery, near Mansfield, for the Sheepbridge Colliery Co.:—
Green, C., Rotherham (accepted).

OSWESTRY.—For the erection of a reservoir, keeper's cottage, two workmen's cottages, whim shed, workshops, roads, fences, &c., at Oswestry, and of a cottage and whim shed at Parc Uchaf, for the Vyrnwy waterworks committee of the Liverpool city council:—
Hughes and Stirling, Liverpool (accepted) £5,084 7 5

SOUTHALL.—For the erection of latrines, lavatories, &c., at the St. Marylebone Schools, Southall, for the Guardians of the Parish of St. Marylebone. Mr. H. Saxon-Snell and Son, London, architects:—

Killingback, C.	£2,600 0 0
Collinson, J. F.	2,478 0 0
Brown, W.	2,265 0 0
Nye, T.	2,057 0 0
Wall Bros.	1,972 0 0
Gibson, G. (accepted)	1,885 0 0

STAINES.—For additions to house and sanitary work at the Retreat, Penton-road, Staines, for Mrs. Bolton. Mr. S. Alen, 240, Lancaster-road, W., surveyor:—

Langler and Pinkham	£600 0 0
Wheatley and Sons	585 0 0

STOKE NEWINGTON.—For erection of houses at rear of Jolly Butchers p.h., Stoke Newington-road. Mr. J. C. Reynolds, architect:—

Cocks, J. and H.	£2,239 0 0
Jackson and Todd	2,198 0 0
Parker, H.	1,950 0 0
Shurmur, W.	1,944 0 0

STUBBINGTON.—For water tower and servants' hall, &c., at Stubbington House, Stubbington, for Mr. H. Foster, C.C. Mr. W. Yeardye, Gosport, architect. Quantities by the architect:—

Hill, W., and Co., Gosport	£1,461 0 0
Tuttle, E., Fareham	1,438 10 0
Hall, T. P., Southsea	1,353 0 0
White, F. G., and Sons, Landport	1,345 0 0
Wareham, C., Stubbington	1,298 0 0
Jones, H., Southsea	1,295 0 0
Crockerell, J., Landport	1,248 10 0
Rapley, W., Gosport	1,223 15 6½
Plummer, J., Fareham*	1,210 0 0
Beech, G., Southsea	1,188 0 0

* Accepted.

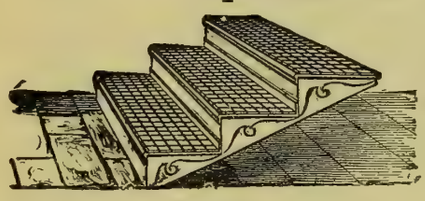
STUBBINGTON.—For the erection of a pair of cottages at Stubbington, for Mr. H. Foster, C.C. Mr. W. Yeardye, Gosport, architect:—
Wareham, C., Stubbington (accepted) ... £600
(Thirteen tenders received.)

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Borough Road, Mersey Tunnel
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Highbury
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Holyhead
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Horley
Hounslow
Hounslow Barracks
Keighley
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Kilsby
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Langley Green
Latimer Road
Lea Bridge
Leamington
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Leyton
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Liverpool Road, Manchester
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Llandudno
Long Buckby
Loudoun Road
Ludgate Hill
Mark Lane
Maidstone
Manchester
Manchester, Exchange
Manchester Road
Mansion House
Mildmay Park
Millhill
Milverton
Monkwearmouth
Moorgate Street
Monument
Newcastle-under-Lyme
New Cross
Newport
Newton Heath
North Brentford
North Bridge
Northampton (Castle Station)
Nottingham
Oldbury
Old Ford
Oldham (Mumps)
Paddington
Parsons Green
Patricroft
Penzance
Pickle Bridge
Plaistow
Pleck
Plymouth
Poplar
Portsmouth
Prestwich
Radcliffe
Roade
Salisbury Road
Seething Lane
Shadwell
Sheffield
Shoreditch
Sloane Square
Snow Hill, Birmingham
Slough
Soho
South Bromley
South Kensington
Southport
Speke
Spring Grove
Stechford
Stepney
Stoke
Stourbridge
Stratford
Stretford
Sudbury
Sunderland
Sutton
Sutton Coldfield
Temple
Thornton
Torquay
Tower of London
Tring
Tynemouth
Upton Park
Victoria
Victoria Park
Walham Green
Wallsend
Walsall
Waterloo, Liverpool
Weaste
Werneth, Oldham
Westbourne Park
West End Lane
Westminster
Whitchurch
Whitechapel
Whitefield
Whitley
Widnes
Willenhall
Bridge
Willesden
Wood Green
Wormwood Scrubbs
Worsley
Wolverhampton
Wolverton

Barracks.
Aldershot
Ashton-under-Lyne
Barnet
Belfast
Budbrook
Burnley
Caterham
Chatham
Chester
Coventry
Curragh Camp
Dublin, Beggar's Bush
Dublin, Island Bridge
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Dublin Royal Barracks
Dundalk
Dublin Castle
Police Barracks

Schools, &c.
Eastney
Fleetwood
Fulwood
Halifax
Hamilton, Glasgow
Hulme
Knightsbridge
Colchester
Leicester, Glen Parva
Manchester
Newbridge
Newcastle-on-Tyne
Normanton
Northampton
Norwich
Portsea
Portsmouth
Preston
Regent's Park
Salford
Shorncliffe
Trim
Warley
Winchester
Woolwich
Wrexham
Stratford, Colgrave Road
Belfast Methodist College
Stratford, Salisway Place
Battersea, St. Mary's Church
Sutton
St. Jude's
Birmingham, Cowper Street
Tayport
Torrington
Clapham
Upton Cross
Forest Gate
Wandsworth
Hanway Place
Harrow
Haverstock Hill
Orphan Working School
Jamaica Level
Leyton, Grammar School
Leyton, Church Road
Newhaven
North Bow
Old Ford
Poplar, Byron & Bright Streets
Southsea, Church Path
Southsea, Omega Street

Hospitals.
Belfast County Lunatic Asylum
Greenwich Infirmary
Guy's Hospital
Lincolnshire
County Asylum
Middlesex
County Lunatic Asylum
Netley Hospital
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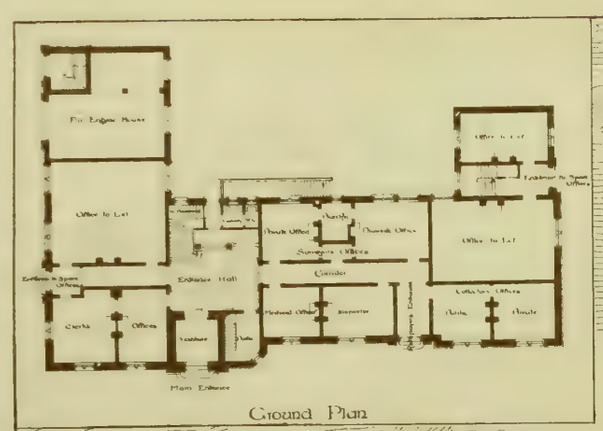


CONVENT OF LAS HUELGAS, BURGOS.

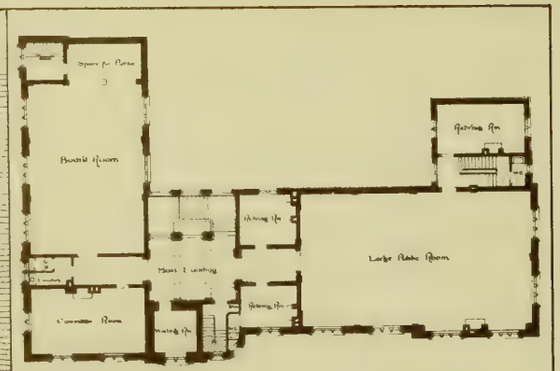


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PUERTA DEL SOL, TOLEDO.



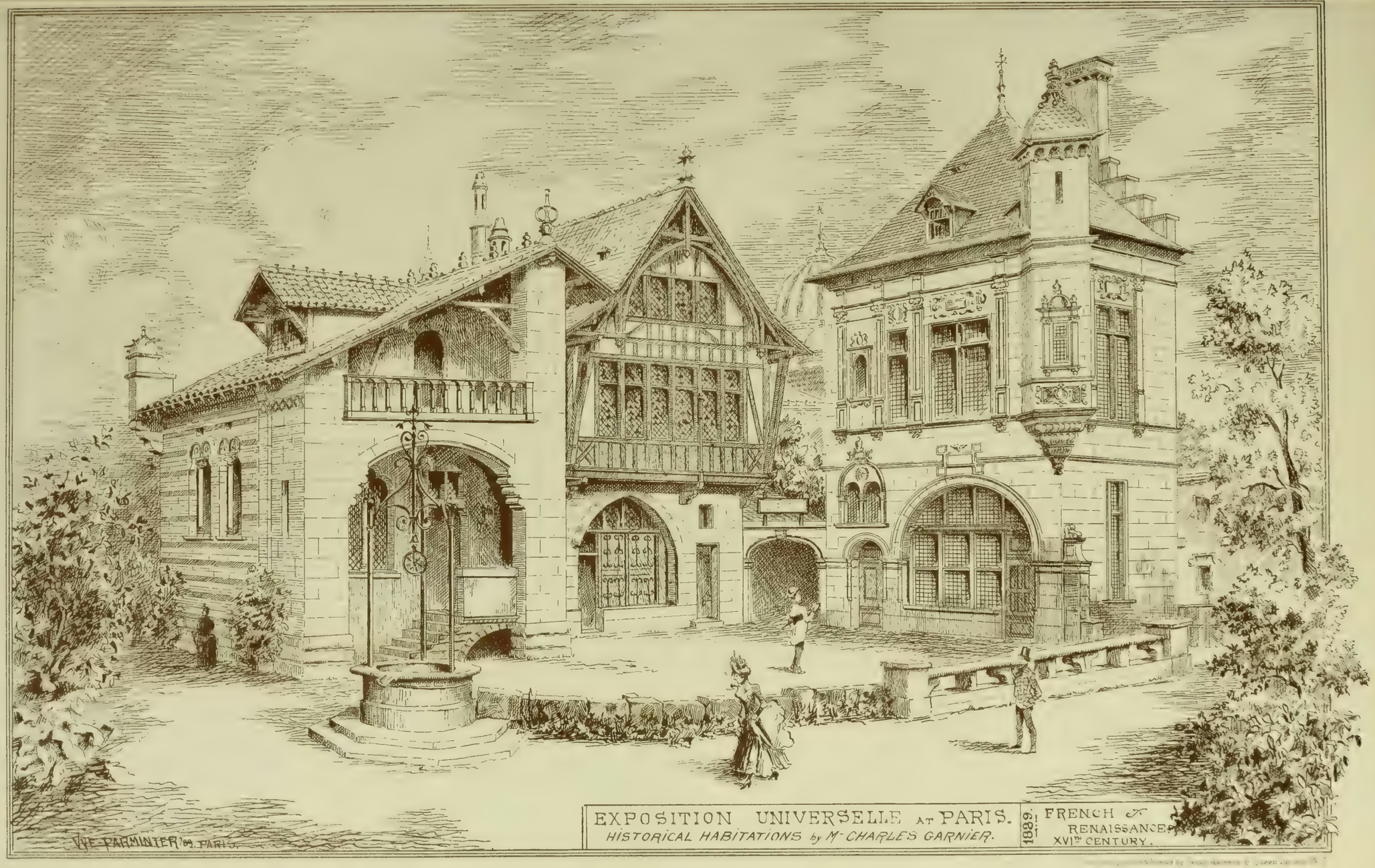
Ground Plan



First Floor Plan

SWINDON NEW TOWN PUBLIC OFFICES.

Brightwen Binyon ARIBA Architect.

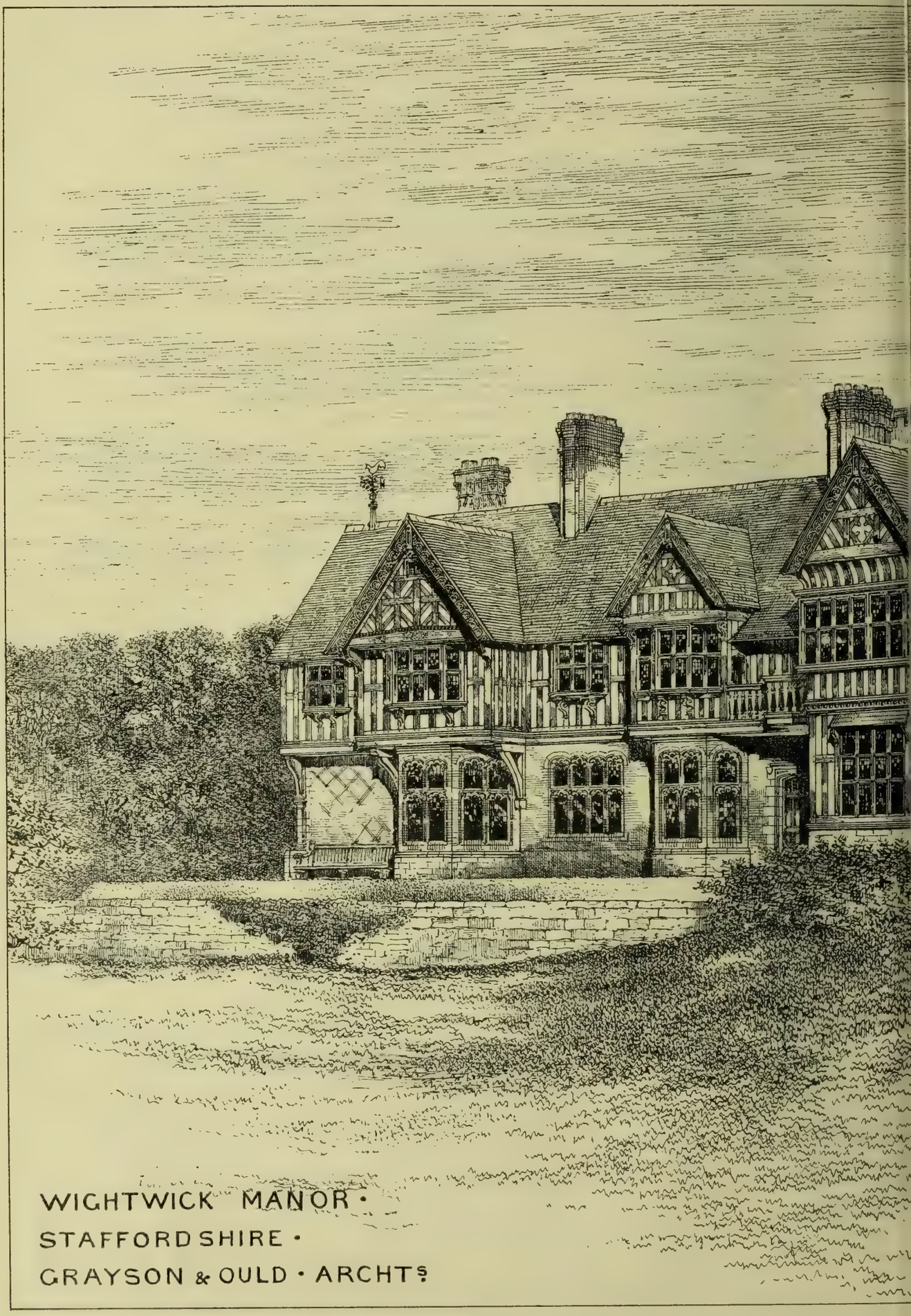


EXPOSITION UNIVERSELLE AT PARIS.
HISTORICAL HABITATIONS by Mr CHARLES GARNIER.

1889.

FRENCH
RENAISSANCE
XVIth CENTURY.

VAE PARMINTER '89. PARIS.



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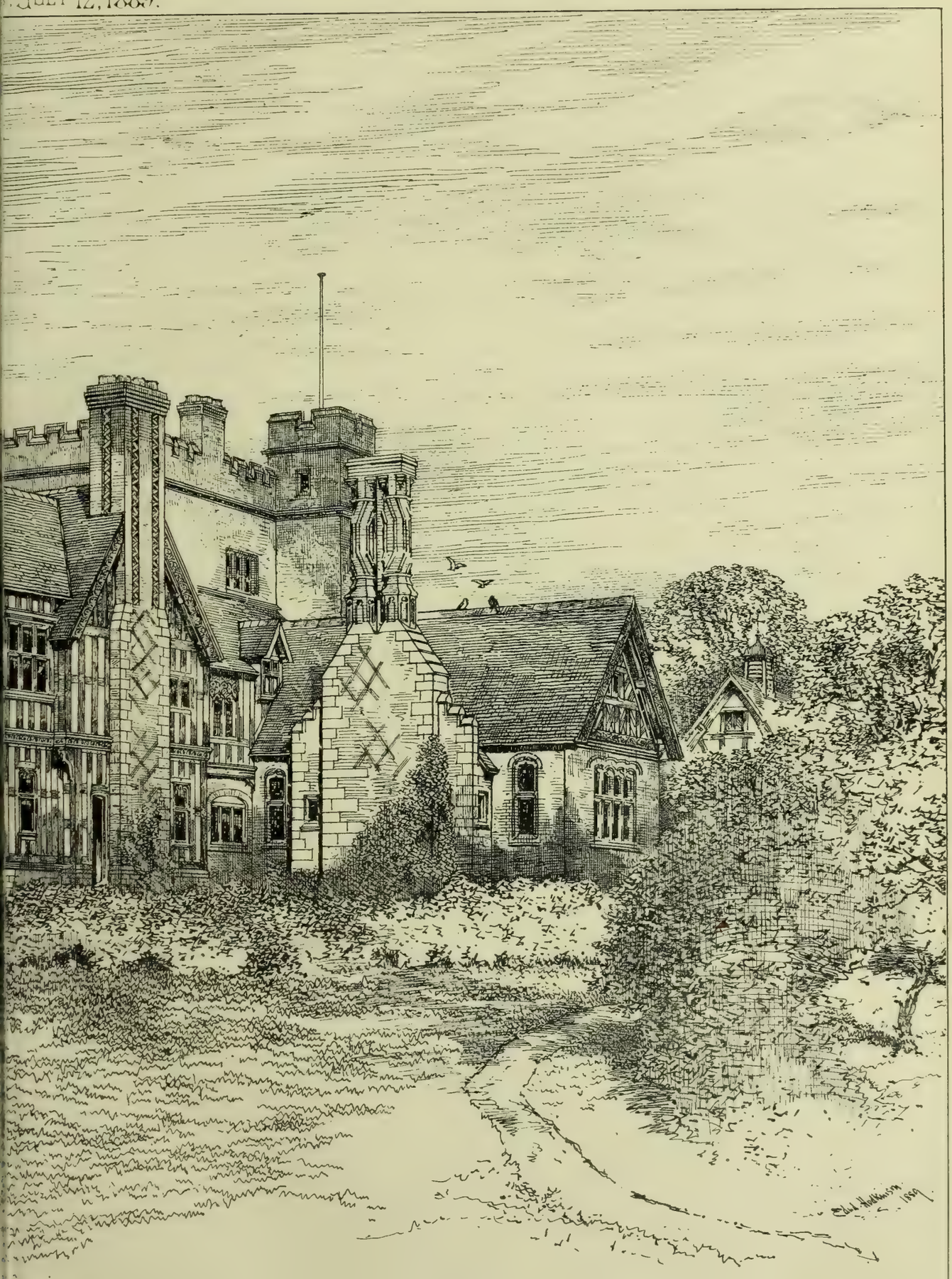


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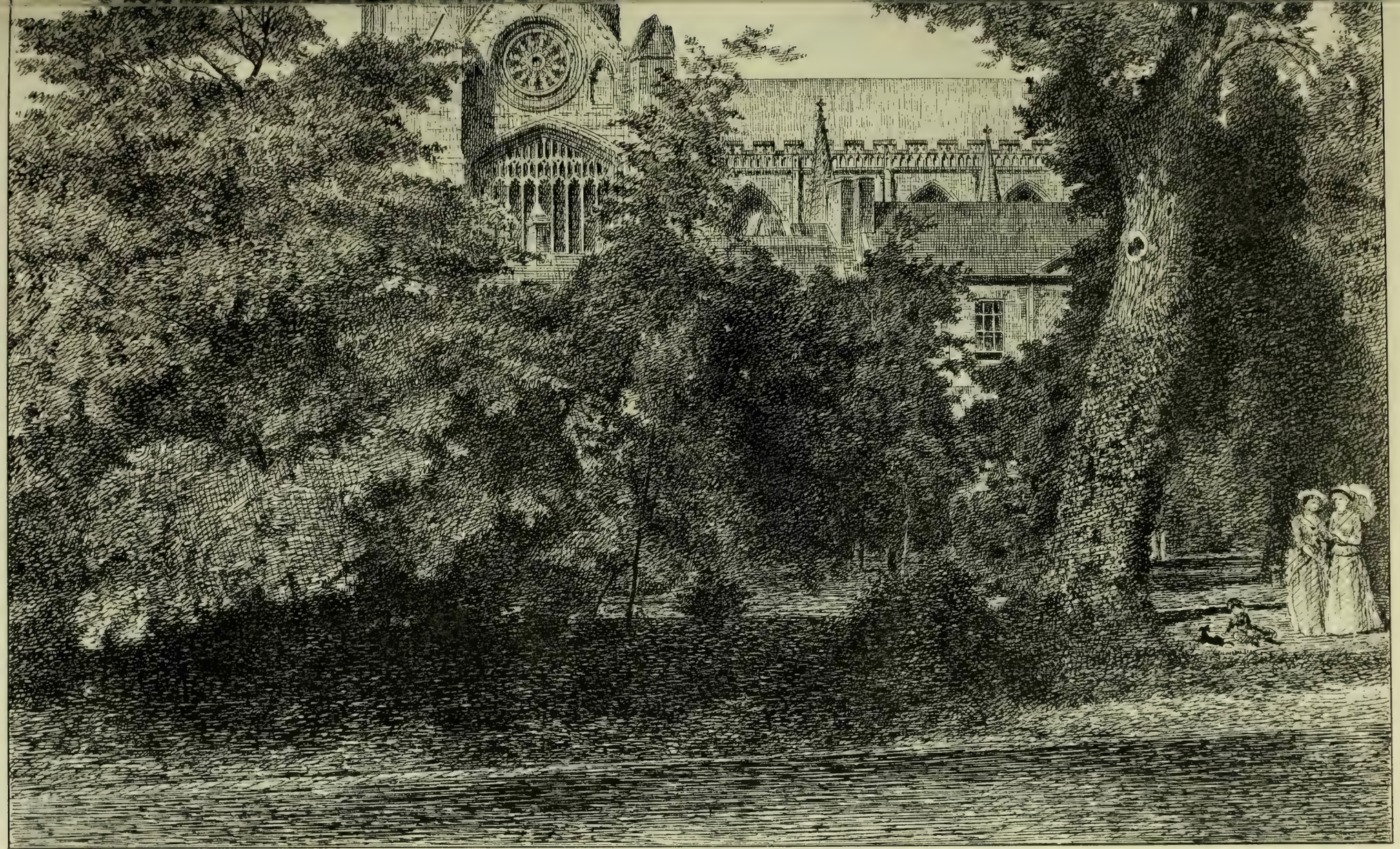


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- LICHFIELD CATHEDRAL -

P.E. MASEY. DELT.



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TOMB OF CARDINAL FORTEGUERRI DEL VERROCCHIO.

PISTOIA CATHEDRAL.

The Pentecost, Paris, 13th July, 1853.

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1802.

FRIDAY, JULY 19, 1889.

ACCEPTANCE OF CONTRACT.

THOSE who undertake contracts are supposed to be aware of the duties and obligations which are implied by them, though a numerous class, who look upon a contract as a mere game of chance, are ready to throw up the work whenever any occasion arises of which they disapprove. They are willing to tender, but do not like to be held by any binding covenant, and are generally found ready to take advantage of any circumstance that will enable them to back out of their engagements. The architect meets with men of this description very often in the course of his practice: they are men whose main object is to do business; contracting is matter of form merely with them, and they sign their names to the document without any intention of incurring risks. The lowest tendering is generally found amongst those who hold thus lightly the obligations of contract, and if in every dozen contracts a man is his own master in half that number, he can afford to undertake business that would ruin a conscientious builder. Cheapness is, nevertheless, the order of the day: people prefer to put up with the chance of getting a work done for a little cost, holding their architect responsible, than in paying a fair profit to a good tradesman. We have known individuals who would accept the lowest tender, even if they were assured on the best of proof, that the work could not be done for the money. Need we wonder, then, that the term "contractor" has come to mean two very different classes of men—the genuine and the counterfeit, those who are willing to accept the obligations and duties of the contractor, and those who are only willing to sign a document, but who are not prepared to carry out the architect's meaning? Many recent cases have shown the eagerness with which a certain class of builders avail themselves of flaws in the specification and quantities, the claims they make for items not inserted, but clearly intended. For example: Oak was specified for the staircase balustrading and dadoes of a hall in a country residence; the drawings were referred to in support of the intention, but the builder refused to execute it in that material without an extra, because the quantities did not name oak specifically. A common subterfuge of contractors who have taken work at a price they cannot conscientiously execute it for is to find cause for delay. An order is given for some extra work, or the employer, through some vacillation or hesitancy on his part, causes a trifling hindrance. The contractor refuses to complete within the time, and he cannot be held liable for any damage caused by such delay. He can plead—and he often does—that the delay has been owing to the architect not supplying working drawings or instructions.

The modern building contractor likes to split straws sometimes on legal points. He has a keen sense of when a tender ought to become a contract—as in a point raised in the Court of Appeal the other day between the Guardians of Dartford Union and Trickett and Sons. The plaintiffs brought an action to recover damages for breach of contract—in other words, for a delay in the delivery of granite, the defence being that there was no contract under the seal of the guardians, to which the contractors had given assent. We must refer our readers to the facts as reported in our "Legal" column (July 5th); it is sufficient to mention here that the tender of the defendants was accepted subject to a contract which the plaintiffs had sent on afterwards. This contract the defendants slightly altered, inserting in it the words "weather and other circumstances permitting," and signed it. The words "and other circumstances" were taken out or erased by the plaintiffs' clerk a day or two afterwards, but notification of the alteration was made to the defendants. They, however, took no notice of the alteration, and contended that the only contract they assented to was with the before-mentioned condition, but which had never been sealed. Two or three points of importance may be noticed here. The acceptance of a tender is generally made subject to a contract, though as a matter of law the tender and the acceptance of it, when unqualified, constitutes a binding contract between the parties. A good advertisement for building contracts should, after inviting tenders, state that the promoters do not hold themselves responsible for the accuracy of the bill of quantities, which must be verified by the person tendering, and that a copy of a form of contract can be seen. In the above case the tender was accepted subject to a contract, which the builders had apparently not seen—it was a proposal for one. If the contractors had seen a form before tendering, the after-differences could not have arisen. The defence set up, that the defendants had not assented to the contract that had been sealed, shows the importance of a tenderer seeing a form before he submits a tender. We may add the condition, "weather permitting," is a reasonable one, which most intending contractors would insist upon being introduced.

How far the assent of the parties was obtained to the contract, which had been slightly altered by the guardians, would be impossible to say. It would be to enter into the mazes of casuistical reasoning to discuss the question. The only clue the Master of the Rolls had was that the defendants had not objected to the alteration either by letter or otherwise, and he assumed, from absence of evidence to that effect, that they had assented. On this ground he contended there was a binding contract when the plaintiffs affixed their seal. Then another point arose as to the seal of the Guardians which was affixed to the document—before or after it became a contract? The Master said, "If any person made an offer with his signature attached, in a case where a signature was necessary to support a contract, and that offer was accepted by the other side, it was clear that the signature then became the signature to the contract," and the same reasoning applied to a corporation where it made an offer under seal, and that offer was accepted. The other judges concurred in this view. The assent or non-assent of a builder to a formal contract should clearly be made known to the other side by writing or otherwise. Assent of the mind is not sufficient unless communicated, and communication need not be in writing or in words; conduct would amount to the same thing, and to treat the matter with silence—withholding assent—is construed to mean that the party is willing to acquiesce in the conditions. The ruling of the Court will be of use if it informs the builder who tenders upon certain conditions, and the tender is accepted, that those conditions must be carried out, notwithstanding they may appear to him, on further examination, to be somewhat severe. Non-assent will avail him nothing if he has affixed his signature.

Our readers are aware of the importance also of having the seal of a corporate body affixed to a contract. Nothing short of it will bind the members in their collective capacity. To the architect or engineer the corporate seal is a guarantee that they will become a responsible body, although there are cases in which individual members of the body will be preferable as parties to the contract. When individuals are found ready to become responsible, their names and signatures will be sufficient, or that of any director or member. To builders and employers alike, the admonition is necessary that a contracting mind may be implied by certain acts which may be considered in themselves irregular and trivial. The terms may not always be expressed in writing, but the conduct of both, or that of one, of the parties may be interpreted by the law to imply a contract, and no hesitancy on the part of one member will be of any use in setting aside the obligations and duties that are attached to the observance of the agreement.

Both parties to contracts would be deriving advantage by a code of rules, such as that which the Association of Builders in the United States have framed for their guidance. The practice of architects selecting known builders to compete, who in their turn obtain the services of sub-contractors in the various trades, has at least the salutary effect of narrowing the limits of competition. The architect soon associates himself with a number of skilled artificers in their several trades, each of whom is bound by certain terms of contract to carry out the work to his satisfaction. The co-operation of architects is necessary to insure a code of rules to be observed by builders. The code should define the terms of notices to competitors for tendering, the form of contract that is desired, the number and scale of the plans for competition tenders, the details that ought to be shown, the specification, any restrictions as to sub-contracting, and generally anything necessary to make the tender trustworthy and equitable. The present condition of the English contractor is not likely to be improved till architects and builders are found to be more in agreement upon matters of fundamental character, and the desire of one class to get the better of the other is conquered.

NECESSARY BUILDING LEGISLATION.

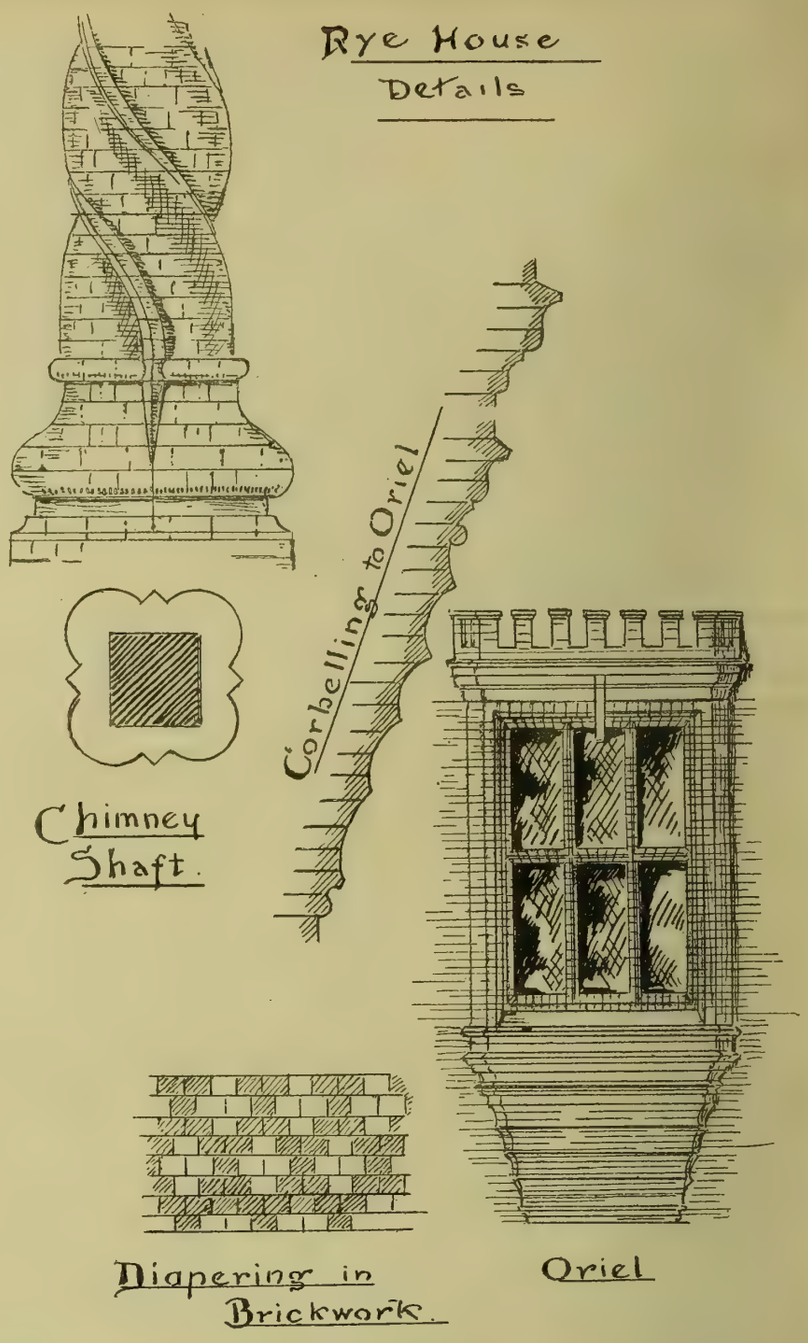
IN the rectification of building lines, and in the formation of new streets and roadways, the Works Committee of the new County Council have much before them. Only to deal with those matters which their predecessors have left for them to rearrange and adjust will be no light matter. What, for example, is to be done with those irregular lines of buildings which the late authorities have created by their indecision and discretionary powers; those half-completed, half-drained roads which may be seen all over the Metropolis, defying future vestries to deal with? or those regulations as to old buildings and places of public amusement and resort which have only been partially carried out? The condition of a large number of our thoroughfares testifies to the very imperfect machinery that has been in operation, where one part of the road has been paved with wood, and another part left with granite; one portion kept in order and watered, and another neglected; where in one division the paving has been repaired, and a little further on left full of ruts and depressions for the rain to fill, for the discomfort of pedestrians.

We are all well aware of the difficulties which beset the committees who have to deal with questions of frontage. Private rights have to be considered and respected; then there are deputations of ratepayers and owners, technical points of law, previous decisions of the Courts, in addition to other details which tend to bewilder and confuse the minds of those who have to report upon each case. One of the most pressing questions is that of deciding upon a line of building when old houses have been pulled down. A case of this kind came before the Metropolitan Board of Works some time ago. A cross-road had been formed from an old

thoroughfare. On one side of it the houses were detached, and had deep gardens in front; on the other side of the cross-road the houses were few and far between, but a portion of a terrace of houses built about twenty or thirty years ago existed, which had been allowed to come out beyond the old line. The difficulty was in deciding which side was to be followed when the property on the terrace side of cross-road came to be rebuilt. Why should the terrace of only a few houses, erected before the 75th section of the Act came into force, determine the line, when there was a long line of old houses on both sides which were in evidence as to the boundaries of the road? The terrace was clearly an old encroachment, and ought not to have been taken as a guide; but the committee and those who advised thought otherwise. They could not ignore the projecting line of terrace, and ultimately decided that the new corner house should be placed on a line with them, or nearly so. To avoid the seeming encroachment, however, they set it back a few feet, where it stands, a monument of vacillation and ignorance. Far better it would have been to ignore the projecting terrace, and show a far-sighted policy of conforming to the statutory rule. The section which refers to roadways where the houses exceed 50ft. distance from the highway seems to be set aside in many instances, and an arbitrary decision arrived at. Those who have the fortune to live in a thoroughfare bounded by front gardens of considerable depth have a right to look to some protection from builders. According to the section no building ought to be erected within 50ft. of the highway, when the frontage of the buildings therefrom amounts to or exceeds that number of feet. How is it that we have so many violations of this salutary rule?

Another matter to which attention ought to be called, is to what extent the vestries have control over land protected by Act of Parliament. There are many instances in which land so protected has been leased to individuals who have the power to sublet it in an objectionable manner. We know, for example, a piece of common land attached to a house which has been let out for trade advertisements. The vestries or local authorities appear powerless to interfere, though the erection of boards and placards is clearly an infringement of public rights. The vestry or County Council should have the power to prevent the use of such land for any purposes that destroy the intention of the Act conferring benefit on the ratepayers. Surely the advantage is small to them when the land is closed or fenced in, and the least that can be done is to prevent the leaseholder from letting the land they have certain rights over for objectionable uses.

The over-building mania in London should exercise the attention of the Council, and they would be conferring a boon on citizens if some statutory enactment were made to restrict the number of stories to which residential buildings are carried. It would be practicable to limit the height of buildings of this class to the width of the street in the more crowded parts, and in the suburban localities to something less, say four stories. Public buildings of an ornamental character, in which we should include churches, chapels, town-halls, and museums, might form an exempted class. We are sure a reasonable schedule might be drawn up, which would in no wise check the development of healthy building enterprise, but would place a check on that more questionable class of speculation which has done so much to injure localities and to drive out of easy distance the prosperous classes of the community. In the same direction some by-laws are certainly required to restrict the making of new roads on estates, which in many cases are not wanted, and can only add to the taxation of the ratepayers by maintenance. New and unnecessary roads are constantly made solely to develop the resources of an estate by getting more houses upon it than it can properly hold. This is one way in which the present leasehold tenure is found objectionable, but which the Town Holdings Committee in their report appear to have overlooked. A great deal has been said on the advantages derived from the oversight of the ground landlord on some estates; but we think the experience of most people interested in building estates is to prove the contrary. The creation of ground rents has been the motive for the unnecessary making of frontages, which is inimical to those who desire to acquire the fee simple.



ARCHITECTURAL BRICKWORK.

XIV.

ORNAMENTAL DETAILS.

WINDOWS are features upon which the art of the bricksetter has been displayed to advantage. Arches, architrave mouldings, and mullions are frequently met with of gauged and moulded bricks. We give here a sketch of a square-headed mullioned window to Rye House, formerly the gatehouse to a castle which commanded the ford of the River Lea. Rye House is historically associated with the plot known by that name, the upper room having been the scene of the conspiracy formed in 1683 with the object of assassinating Charles II. on his return from Newmarket. The window-jambs and head are of bricks moulded to a section commonly met with in stonework. It will be noticed that the lower course of the head and the transom are formed of bricks cut with radiating joints. The most noticeable feature is the brick corbelling supporting the oriel, which is formed of a series of hollows, returning round the splayed sides, worked in horizontal courses. We give a section of the corbelling, which shows that the cuspings between the hollows are formed in the brick. The upper mouldings are of bold contour, and are good examples of cut work; the curves are not too deeply undercut, and avoid acute angles at the joint—a

consideration of importance in gauged brickwork, which has to be rubbed to a smooth face. In setting out work of this kind much care is necessary. With corbels of circular shape on plan, the courses must be regulated by a radius rod for each course struck from a common centre, the faces of the bricks being cut to the curve. The bevels will be different for every course. In work of this description the brick bond is generally all headers, as they save cutting, and suit a curve better than bricks placed lengthwise. The work is generally set in putty. A few good instances of corbelled windows are to be seen on the Chelsea Embankment, Kensington, and other parts of London where brick architecture is to be found. The window from Rye House is not the only example of workmanship.

The spiral chimney shaft, of which we give a sketch of a portion with a plan, is a singularly interesting type of cut brickwork. The four half-circles on plan, which wind up the shaft, are separated by fillets set anglewise, and are very accurately worked, and make about two and a half revolutions. At the summit the shaft terminates differently to the commencement, and shows two of the winding fillets in elevation, or the plan at the summit is turned diagonally towards the eye, and has a moulded capping mitred round each of the members. The height of shaft, including base, which is entirely of cut brickwork, is about 13ft. At the side of gateway, which is groined at the inner side, is a spiral stairway of brickwork, in which the steps and centre newel are of the same material; even the handrail is formed of brick cut in the wall, a sinking being made for the hand. The building has also beneath the oriels a series of intersecting arches on stone corbels, and the surface of wall between the oriels and the parapet is diapered in red and black brickwork, as shown in our sketch.

The brick parapet, embrasured, is a feature which the old brickworker knew how to make the most of, as it lent itself to a material moulded in equal-sized blocks. We have in Essex and Norfolk many interesting examples of brick parapets. The restored church-tower of Inworth, Essex, is a good example. The bricks used were thin, with moulded bricks for the capping of crenelles and merlons and stringcourses. The advantage of using terracotta for features and details of this description has greatly militated against the employment of bricks for them. The labour and accurate workmanship necessary, for example, in executing a window or chimney-shaft like those of Rye House in cut brickwork are considerable. The same result can be obtained in a bolder manner by terracotta, which can be modelled in blocks occupying several courses of ordinary brick, and with a sharpness and accuracy in the moulded parts which leave nothing to be desired. The durability also of terracotta is in its favour. Another point that in the architect's mind is a matter of importance is the variety of tint obtained by using the latter material with brickwork. Terracotta is generally burnt to a rather lighter shade of red, which goes well with the darker tone of the brick. For jambs and mullions of doorways and windows and all details of this kind terracotta is more suited, inasmuch as it can be used in longer pieces. For heavier masses, such as cornices and parapets, corbels to oriel windows, weatherings and dressings, it also has the merit of being more expeditiously set, and of giving a better finish to the building. On the other hand, we may say, in favour of cut and gauged brickwork, that it has more artistic interest. The eye and hand of the cutter and carver are brought into notice, whereas in all cast or moulded work we lose this element of individual workmanship. The latter and choicer art of the two will be necessarily limited to buildings in which the ornamental work is of small extent, as in the cut brickwork seen on many of the West-end buildings or the gable ends of houses. Where great durability and wear are required the harder cast and fired material will always have the preference.

THE LIGHTEST FORM OF PLATE GIRDER.

EVEN at the present time, notwithstanding all the attention that has been bestowed upon girder work of every class, the proportioning of girders does not receive the full consideration to which it is entitled by designers. It too commonly happens that a certain arbitrary proportion of depth to span is adopted as suitable, and applied without discrimination to structures the conditions of which vary considerably; it is therefore our intention in this article to inquire into the relations existing between the flanges and web of a plate girder from an economic point of view. In such an investigation, to arrive at results that shall be satisfactory, all our data must be of the most practical character obtainable, as it is to purely practical ends that our efforts are directed.

If the plate distribution is carried out in the closest approximation obtainable to the theoretical requirements, we find that the actual weight of the flanges of a girder freely supported at the ends and loaded uniformly throughout its length will be in excess of the theoretical weight by about 12 per cent., and this basis we shall take for comparison of weights of flanges and web. The dimensions of the web will be in great measure—and at the centre of the span entirely—determined by practice; hence the proportions will be sought upon the assumption of a given thickness for the web in each particular case. The thickness of the web taken will not be the net thickness of the web plates simply, but that measurement with such an addition as will include stiffeners, thus—Suppose we have a web ½in. thick, and at every 4ft. of its length a stiffener on each side, of tee-iron 6in. by 4in. by ⅝in. thick; then the thickness, averaged, to include these will be that of the plate plus the sectional areas of two stiffeners divided by their distance apart along the web; the area of a 6in. by 4in. by ⅝in. tee-iron is 5·86sq.in., and 5·86 × 2 ÷ 48 = 0·244in, so that the thickness taken would be in this case 0·5 + 0·244 = 0·744, very nearly ¾in. About the rivets we need not here concern ourselves, as they will form an equal percentage on flanges and web, and therefore will not affect our calculations.

Let l and d = the span and depth respectively in feet; w = load in tons per foot; s = working stress per sectional square inch on gross area of flanges (if the stresses on the *gross* area are different, for the top and bottom flanges make s = the mean of them); x = equal distance of any point at which the areas are taken from a point of support in feet; t = thickness, inclusive of adjuncts, of web in inches. The weight of the girder at any section will vary as its sectional area.

The theoretical area of one flange is found from the formula—

$$a = \frac{w\,l\,x}{2\,d\,s} - \frac{w\,x^2}{2\,d\,s};$$

the practical expression for the two flanges, adding 12 per cent., will, therefore, be—

$$= 1{\cdot}12 \left\{ \frac{w\,l\,x}{d\,s} - \frac{w\,x^2}{d\,s} \right\}.$$

The sectional area of the web will be represented by $12\,d\,.\,t$; and the whole area by the equation

$$A = 1{\cdot}12 \left\{ \frac{w\,l\,x}{d\,s} - \frac{w\,x^2}{d\,s} \right\} + 12\,.\,d\,t.$$

What we now have to determine is that value of d in relation to l that will give the whole equation its minimum value. Assuming the value of l to be fixed, that of A for any given point will vary with d. When d is at a value corresponding to a minimum value of A, it may be assumed that this value will remain stationary for an *indefinitely small* variation of d. It will be seen that the equation may be divided into two parts, one positive $\left(1{\cdot}12 \frac{w\,l\,x}{d\,s} + 12\,.\,d\,t.\right)$ and one negative $\left(-\,1{\cdot}12 \frac{w\,x^2}{d\,s}\right)$. If, therefore, during the indefinitely small variation of d, the whole value of the equation remains the same, the variation of the one part must equal that of the other. Let h become $(d + h)$, then equating the differences of the positive and negative parts of the expression, we shall have:

$$\frac{1{\cdot}12\,w\,l\,x}{d\,s} - \frac{1{\cdot}12\,w\,l\,x}{(d+h)\,s} + 12\,.\,d\,.\,t - 12\,(d+h)\,t = \frac{1{\cdot}12\,w\,x^2}{d\,s} - \frac{1{\cdot}12\,w\,x^2}{(d+h)\,s}$$

Transposing—

$$12\,d\,.\,t\,. - 12\,(d+h)\,t = -12\,h\,t = \frac{1{\cdot}12}{s}\left\{ \frac{w\,x^2}{d} - \frac{w\,x^2}{d+h} - \frac{w\,l\,x}{d} + \frac{w\,l\,x}{d+h} \right\} = \frac{1{\cdot}12}{s\,(d+h)}\left\{ = \frac{w\,x^2\,h}{d} + \frac{w\,l\,x\,h}{d} \right\}$$

Therefore—

$$12\,.\,s\,.\,t\,.\,h\,d^2 + 12\,.\,s\,.\,t\,h^2 d = 1{\cdot}12\,[w\,x^2\,h - w\,l\,x\,h].$$

As, however, h has been assumed to be indefinitely small, h^2 will be comparatively insignificant, and, therefore, the term $12\,s\,t\,h^2\,d$, in which it is a factor, may be neglected, and the equation will become—

$$12\,.\,s\,t\,h\,d^2 = 1{\cdot}12\,[w\,x^2\,h - w\,l\,x\,h]$$

Whence—

$$d^2 = \frac{w\,x^2 - w\,l\,x}{10{\cdot}7143\,s\,.\,t}, \text{ and } d = \sqrt{\frac{w\,x^2 - w\,l\,x}{10{\cdot}7143\,s\,.\,t}}.$$

From the circumstances of the expression, d^2 would come out a minus quantity, which cannot occur actually, and the numerical result being unaffected by changing the signs, the formula may be written

$$d^2 = \frac{w\,l\,x - w\,x^2}{10{\cdot}7143\,.\,s\,.\,t}; \text{ and } d = \sqrt{\frac{w\,l\,x - w\,x^2}{10{\cdot}7143\,.\,s\,.\,t}}$$

thus making the latter a rational quantity. The stationary value assumed for the equation to A would apply also to cases where a maximum might occur; but the conditions of the problem are such that the result cannot be a maximum, for, to the maximum there is no limit, as there is no limit to the depth of the girder; that our result is a minimum we will now illustrate and prove by three arithmetical examples. Let the depth at the centre of the span be taken, then $x = \frac{l}{2}$, and

$$d = \sqrt{\frac{w\,l^2}{21{\cdot}428\,.\,s\,.\,t} - \frac{w\,l^2}{42{\cdot}8572\,.\,s\,.\,t}} = \sqrt{\frac{w\,l^2}{42{\cdot}8572\,.\,s\,t}}$$

Let l = 100ft., w = 2 tons, s = 4 tons, and $t = \frac{7}{8}$in. Then the depth of the girder at the centre of the span

$$= \sqrt{\frac{2 \times 10{,}000}{42{\cdot}8572 \times 4 \times \frac{7}{8}}} = 11{\cdot}547\text{ft.}$$

This should be the value of d corresponding to a minimum value of A, which, at the centre of the span,

$$= \frac{1{\cdot}12\,.\,w\,l^2}{4\,.\,d\,.\,s} + 12\,.\,d\,t. = \frac{1{\cdot}12 \times 2 \times 10{,}000}{4 \times 4 \times d} + 12 \times \tfrac{7}{8} \times d = \frac{1400}{d} + 10.5\,.\,d.$$

We will now work this out for the above value of d and two others, one greater and the other less; let these three values be 11·6ft., 11·547ft., and 11·5ft.

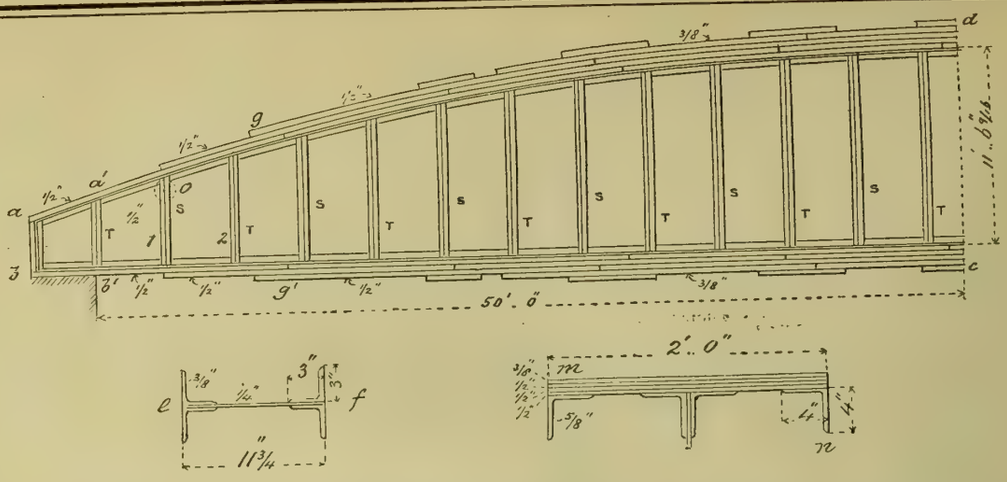
When d = 11·6ft. $A = \frac{1{,}400}{11{\cdot}6} + 10{\cdot}5 \times 11{\cdot}6$
$= 120{\cdot}689 + 121{\cdot}800 = 242{\cdot}489$sq.in.

d = 11·547ft. $A = \frac{1{,}400}{11{\cdot}547} + 10{\cdot}5 \times 11{\cdot}547$
$= 121{\cdot}243 + 121{\cdot}243 = 242{\cdot}487$sq.in.

d = 11·5ft. $A = \frac{1{,}400}{11{\cdot}5} + 10{\cdot}5 \times 11{\cdot}5$
$= 121{\cdot}739 + 120{\cdot}750 = 242{\cdot}489$sq.in.

This proves that the value found for d is that corresponding to the minimum value of A. By inspecting the figures it will be seen that at the minimum the areas of the two flanges together are equal to the sectional area of the web. These areas, it must be remembered, are the average actual areas, that is the area of vertical section of web plates with allowance for adjuncts, and theoretical areas of flanges with 12 per cent. for constructional approximation.

We will now show how to apply the foregoing investigations practically, by setting out a girder on the data given. In Fig. 1, *a b c d* shows one half of the girder in elevation, the thicknesses of the plates being exaggerated that their distribution may be clearly seen; *a′b′* is the line of the face of the support at which the web stress is a maximum, and the flange stress nothing. The web stress at any point is simply equal to the load per foot multiplied by the distance from the centre of the span. The webb stress at the point of support will be 50 × 2 = 100 tons, and as the working resistance to shearing stress is 4 tons per square inch, the sectional area of web



plates alone must not be less than 25in. at that point. Theoretically, the girder terminates at b', but practically it is continued on the support to b to obtain a bearing. If we use web-plates ½in. thick at b', their depth must not be less than 50in., or 4ft. 2in., at that point. The girder is assumed to be stiffened every 8ft. by frames shown in horizontal section at $e f$, and between them by tee-irons 6in. × 4in. × ⅜in. thick. There will be, in 8ft. length of the web, two frames and two tee-irons, of which the sectional areas will be: eight angle-irons 3in. × 3in. × ⅜in. equal 16·875sq.in.; two plates 11¾in. × ½in. equal 5·875sq.in., and four tee-irons 6in. × 4in. × ⅜in. equal 11·718sq.in.—in all, 34·594sq.in. This, divided by 96in. (= 8ft. along web), gives 0·36in. equivalent thickness to be added to web (nearly ⅜in.), so that at this point ⅞in. may be taken as representing the web thickness, including stiffener allowance. At the centre of the span the allowance is rather more, as two frame stiffeners come within 4ft. These stiffeners are indicated by the letter T, the tee-irons by S. The web-plate will, however, be thinner at the centre; but for such a girder it must not be made less than ⅜in. thick, so that we shall be as near as we can practically get to accuracy if we take ⅞in. throughout for effective web thickness, including stiffeners.

To find the depths of the web-plates at every joint, the formula

$$d = \sqrt{\frac{w\,l\,x - w\,x^2}{10{\cdot}7143\,.\,s\,.\,t}}$$

is applied for values of x increasing by 4ft., that being the width of each web-plate, and from the depths so found the form of the girder is set out. The following table shows the depths thus found to the nearest thirty-second part of an inch. The depth at the centre 11·547ft. = 11ft. 6 9/16in. has already been found.

x	d	x	d
	ft. in.		ft. in.
4	4 6 5/16	28	10 4 3/32
8	6 7½	32	10 9¼
12	7 6	36	11 1 3/32
16	8 5 19/32	40	11 3¾
20	9 2 27/32	44	11 5 9/16
24	9 10 11/32	48	11 6 1/16

The necessary sectional area of one flange at the centre of the span will be $a = \frac{w\,l\,x - w\,x^2}{2\,.\,d\,.\,s}$

$= \frac{2 \times 100 \times 50 - 2 \times (50)^2}{2 \times 11{\cdot}547 \times 4} = 54{\cdot}1$sq.in. This is gross area without deducting rivet-holes, and will be correct for the top flange, which is in compression; but we must see if it is sufficient in net area for the bottom flange, which is in tension, having a working stress of not more than 5 tons per sectional square inch net. The required net sectional area will be 54·1 × ⅘ = 43·3sq.in. The make up of the top flange at the centre is shown at $m\,n$. It consists of four angle irons 4in. × 4in. × ⅝in. thick, of which only the horizontal limbs are included in calculating strength, three ½in. plates and one ¾in. plate, all 2ft. wide, giving total area of 55sq.in. If there are four rows of rivets ⅞in. diameter, the loss of sectional area will evidently be 4 × ⅞ × 2½ = 8·75sq.in., which, deducted from 55, leaves 46·25sq.in. net area, which is a little in excess of that required, and corresponds to 4·7 tons tension per sectional square inch, so the top and bottom flanges may be made alike. We will now see how the plates may be reduced as we approach the points of support. It is evident the section cannot be reduced in exact accordance with theory, as the plates are not to be had of tapering thickness, the central section must be maintained to such a distance that the area required at the point reached shall not exceed that left when the outside plate is stopped off, and so on for the other plates. By transposing the expression for the required area, the point corresponding to a given area may be found thus: in the equation $a = \frac{w\,l\,x - w\,x^2}{2\,.\,s\,.\,d}$, replace d by its value, then $a = \frac{w\,l\,x - w\,x^2}{2s\sqrt{\frac{w\,l\,x - w\,x}{10{\cdot}7143\,.\,s\,.\,t}}}$; whence $2\,.\,s\,.\,a$

$= \sqrt{10{\cdot}7143\ [w\,l\,x - w\,x^2]\,s\,.\,t}$. Squaring both sides we have $4\,s^2\,a^2 = 10{\cdot}7143\,[w\,l\,x - w\,x^2]\,s\,t$; whence $x^2 - l\,x = \frac{s\,.\,a^2}{2{\cdot}678\ .\ t\ .\ w}$, and $x = \frac{l}{2} \pm \sqrt{\frac{l^2}{4} - \frac{s\,.\,a^2}{2{\cdot}678\,t\,.\,w}}$

If the sectional area of the top plate (24in. × ⅜in. = 9sq.in.) be deducted from the central sectional area of the flange that remaining is 55 − 9 = 46sq.in.; further deducting successively the remaining plates, we find the sectional areas left to be, 46 − 12 = 34sq.in., and 34 − 12 = 22sq.in. Applying the formula for the value of x corresponding to these areas we find—

When $a = 46$, $x = \frac{100}{2} \pm \sqrt{\frac{10000}{4} - \frac{4 \times (46)^2}{2{\cdot}678 \times \frac{7}{8} \times 2}}$

$= 50 \pm 26{\cdot}32 = 76{\cdot}32$ft., or 23·68ft.

When $a = 34$, $x = \frac{100}{2} \pm \sqrt{\frac{10000}{4} - \frac{4 \times (34)^2}{2{\cdot}678 \times \frac{7}{8} \times 2}}$

$= 50 \pm 38{\cdot}9 = 88{\cdot}9$ft., or 11·1ft.

When $a = 22$, $x = \frac{100}{2} \pm \sqrt{\frac{10000}{4} - \frac{4 \times (22)^2}{2{\cdot}678 \times \frac{7}{8} \times 2}}$

$= 50 \pm 45{\cdot}68 = 95{\cdot}68$ft., or 4·32ft.

The outside tier of plates thus extends 26·32ft. on each side of the centre, the second tier 38·9ft., and the third tier 45·68ft. on each side. These tiers will practically be made a little longer, so that the rivet-pitch may divide up equally into their lengths. Let the pitch of the rivets be 4in.; there will be a line of rivets across the centre, so there must be an odd number of pitches in the length of each tier, making the lengths 53ft., 78ft. 4in., and 91ft. 8in. respectively.

At the joints there will be required on each side of the join rivets giving a total cross-sectional area equal to that of the plates joined. The sectional area of a ⅞in. rivet is 0·6sq.in.; therefore the number in each lap must be—for plate 24in. × ½in., 12 ÷ 0·6 = 20 rivets; for plate 24in. × ⅜in., 9 ÷ 0·6 = 15 rivets. There are to be four rows of rivets, so the length of lap will be 5 pitches × 4in. pitch = 20in. for ½in. plates, and 4 pitches × 4in. pitch = 16in. for ⅜in. plates, as we cannot divide 15 rivets by 4, and shall, therefore, have one rivet extra in each lap in this case.

All the measurements necessary for setting out the half-elevation of the girder have now been determined; the bearing $b\,b'$ for this span will be 4ft. The depth of the web on the line $a'\,b'$ must be 4ft. 2in., as shown above, to give the requisite web-plate area to resist the shearing at that section. All the web depths, from joint No. 2 to the centre of the girder will be those given in the table. At joint No. 1 the calculated height reaches to the centre of the dotted circle o, therefore at this place the depth will practically be greater in order to give a proper contour to the top of the girder. The flange plates are set out in lengths, none of which exceeds 21ft., and wherever possible two joints are brought together to save length of cover, as between the joints one lap length only, of course, is requisite. At g and g' the main plate is prolonged to form lap to a joint in an inner plate. With the method of carrying the end of the girder on the bearings we shall not deal, as the scope of this article does not extend beyond proportioning and distributing the plates, so as to obtain the lightest girder for a given strength. Having determined this for structures carrying uniformly-distributed loads, attention will now be given to the case of a girder carrying a mixed load.

We will now apply the foregoing method of reasoning to the case of a girder carrying a rolling load, such as girders carrying a traversing crane are called upon to sustain, there being also a uniformly distributed load representing the weight of the girder itself.

Let W = the concentrated rolling load, and w = the load per foot run of girder and any roof or other distributed load upon it; then the total area at any point distant x from one of the supports will be

$$A = \frac{2{\cdot}24\,.\,W}{s\,.\,d\,l}\,[l\,x - x^2] + \frac{1{\cdot}12\,w}{s\,d}\,[l\,x^2 - x^2] + 12\,.\,d\,t$$

To simplify the working, let

$$m = \frac{2{\cdot}24\,W}{s\,.\,l.}, \text{ and } n = \frac{1{\cdot}12\,.\,w}{s}.$$

Then

$$A = m\,.\,\frac{l\,x - x^2}{d} + n\,.\,\frac{l\,x - x^2}{d} + 12\,.\,d\,.\,t.$$

Proceeding as before, let d be increased by an indefinitely small quantity h; then the value of A remaining stationary, the differences of the positive terms shall be equal to those of the negative terms of the equation, and

$$m\,.\,\frac{l\,x}{d} - m\,.\,\frac{l\,x}{d+h} + n\,.\,\frac{l\,x}{d} - n\,.\,\frac{l\,x}{d+h} + 12\,d\,t$$

$$- 12(d+h)\,t = m\,.\,\frac{x^2}{d} - m\,\frac{x^2}{d+h} + n\,\frac{x^2}{d} - n\,.\,\frac{x^2}{d+h}$$

Simplifying this equation, and multiplying both sides by $(d + h)$, we get

$$- 12\,h\,t(d+h) = m\,.\,\frac{x^2\,h}{d} + n\,.\,\frac{x^2\,h}{d} - m\,.\,\frac{l\,x\,h}{d} - n\,.\,\frac{l\,x\,h}{d}$$

Therefore,

$$[12\,.\,h\,t\,d^2 + 12\,h^2\,t\,d] = m\,[x^2\,h - l\,x\,h] + n\,[x^2\,h - l\,x\,h]$$

As before, the term $12\,h^2\,t\,d$ containing the square of h may be neglected, and we get

$$12\,t\,d^2 = m[l\,x - x^2] + n[l\,x - x^2] = (m + n)\,(l\,x - x^2)$$

Therefore,

$$d = \sqrt{\frac{(m+n)\,(l\,x - x^2)}{12\,.\,t}}$$

We will now prove the accuracy of this result by

an example, premising that at the centre of the span $x = \frac{l}{2}$, and therefore,

$$d = \sqrt{\frac{(m+n)l^2}{48 \cdot t}}$$

and

$$A = 0{\cdot}56\frac{W\,l}{s\,d} + 0{\cdot}28\,\frac{w\,l^2}{s\,d} + 12 \cdot d\,t$$

Let l = 60ft., W = 30 tons, w = 0·3 ton, s = 4 tons, and $t = \frac{3}{4}$in. Then

$$m = \frac{2{\cdot}24\,W}{s \cdot l} = \frac{2{\cdot}24 \times 30}{4 \times 60} = 0{\cdot}285$$

$$n = \frac{1{\cdot}12\,w}{s} = \frac{1{\cdot}12 \times 0{\cdot}3}{4} = 0{\cdot}084$$

$$m + n = 0{\cdot}285 + 0{\cdot}084 = 0{\cdot}369$$

Then, at the centre of the span,

$$d = \sqrt{\frac{(m+n)l^2}{48 \cdot t}} = \sqrt{\frac{0{\cdot}369 \times (60)^2}{48 \times \frac{3}{4}}} = 6{\cdot}074\text{ft.}$$

We will now find the central areas corresponding to this and two other depths—one larger and the other smaller, 6·148ft. and 5·9ft. respectively.

The central sectional area will be—

$$A = 0{\cdot}56\ \frac{W\,l}{s\,d} + 0{\cdot}28\,\frac{w\,l^2}{s \cdot d} + 12\,d\,t = \frac{327{\cdot}6}{d} + 9 \times d$$

And when—

d = 5·9ft. — $A = \frac{327{\cdot}6}{5{\cdot}9} + 9 \times 5{\cdot}9 = 108{\cdot}625$sq.in.

d = 6·074ft. $A = \frac{327{\cdot}6}{6{\cdot}074} + 9 \times 6{\cdot}074 = 108{\cdot}600$,,

d = 6·148ft. $A = \frac{327{\cdot}6}{6{\cdot}148} + 9 \times 6{\cdot}148 = 108{\cdot}619$,,

These figures show that the result arrived at above (6·074ft.) is the depth corresponding to a minimum sectional area of girder. The formula for depths being thus established, they may be calculated and set out in the same manner as shown in the previous example. Let a = sectional area of flange; then we find as follows the corresponding value of x to show where the plates can be stopped off in arranging their distribution. Proceeding as before—

$$a = \frac{W}{s\,d\,l}[l\,x - x^2] + \frac{w}{2sd} \cdot [l\,x - x^2]$$

$$= \left\{\frac{W}{s\,l} + \frac{w}{2s}\right\} \cdot [l\,x - x^2].$$

But $$\frac{W}{s\,l} + \frac{w}{2\,s} = \frac{m+n}{2{\cdot}24}$$

Therefore— $$a = \left\{\frac{m+n}{2{\cdot}24}\right\} \cdot \left\{\frac{l\,x - x^2}{d}\right\}.$$

$$2{\cdot}24\,a = \frac{[m+n] \cdot [l\,x - x^2]}{\sqrt{\frac{[m+n] \cdot [l\,x - x^2]}{12 \cdot t}}}$$

$$= \sqrt{12 \cdot t\,[m+n] \cdot [l\,x - x^2]}.$$ Squaring both sides $5{\cdot}017a^2 = 12\,t\,[m+n] \cdot [l\,x - x^2]$; whence $x^2 - l\,x = -\frac{a}{2{\cdot}391 \cdot t(m+n)}$. An adfected quadratic equation, which, being solved in the usual way, gives—

$$x = \frac{l}{2} + \sqrt{\frac{l^2}{4} - \frac{a^2}{2{\cdot}391 \cdot t \cdot [m+n]}}$$

We will, in conclusion, give a general expression applicable to any kind or combination of loads to which a girder can be subjected, making the same allowance for excess weight of flanges as before—*i.e.*, 12 per cent. on the theoretical weight.

Let M = the moment of stress, the remaining notation being as before; then—

$$A = \frac{2{\cdot}24\,M}{s \cdot d} + 12 \cdot d \cdot t$$

Let d become

$$(d + h) \text{ then } A' = \frac{2{\cdot}24\,M}{s\,(d+h)} + 12\,(d+h)\,t$$

But by the hypothesis A = A′ when h is indefinitely small; therefore—

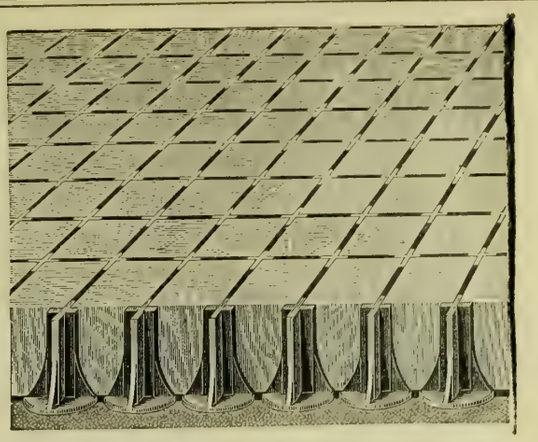
$$A - A' = 0\text{; and } \frac{2{\cdot}24 \cdot M}{s\,d} - \frac{2{\cdot}24\,M}{s\,(d+h)} + 12\,d \cdot t - 12\,(d+h)\,t = 0.$$

$$\therefore \frac{2{\cdot}24 \cdot M\,h}{s\,(d+h)\,d} - 12\,h\,t = 0. \quad 12 \cdot h \cdot t \cdot s \cdot d[d+h] = 12\,h \cdot t\,s\,d^2 + 12 \cdot h^2\,t\,s\,d = 2{\cdot}24 \cdot M\,h.$$

The term containing h^2 is neglected, hence—

$$12 \cdot h \cdot t \cdot s\,d^2 = 2{\cdot}24\,M\,h\text{; and } d = \sqrt{\frac{M}{5{\cdot}357 \cdot t \cdot s}}.$$

By replacing M by the equation applying to any particular case, the value of d for that case is found, and the value of x corresponding to a given reduced area may be evolved by proceeding as in the examples given above.



IRON PAVING IN SHEFFIELD.

THERE is now being tried at Sheffield an interesting experiment in the adaptation of iron for street-paving. A year and a half ago a small piece was laid down privately at the entrance to a manufactory. As that proved serviceable, the consent of the Sheffield Corporation was obtained for a trial of the system in one of the streets where it would be subject to the heaviest traffic in the town.

As shown in the accompanying engraving, the iron is used in the form of upright studs, each one having an independent base. The horizontal section of the stud is cruciform, the angles of which carry the corners of the four adjacent blocks of wood; thus each stud carries four blocks, and each block is carried by four studs. Upon a concrete foundation there is a thin layer of asphalte, upon which the studs bed themselves; these being slightly taper, the wood blocks are wedged slightly in, the interstices of which being filled with pitch, the whole is firmly bound together. The ends of the studs projecting slightly above the wood, not only carry the weight of vehicular traffic, but give a foothold to horses which is lacking in ordinary wood-paving, and dispenses with the usual gravel sprinkling. The experimental piece was laid down in Saville-street about two months ago. The work was done by Mr. G. Carr, contractor, of Carlisle-street, and consists of thirty-eight superficial yards.

THE NEW SCOTTISH NATIONAL PORTRAIT GALLERY.

EDINBURGH has got her new Portrait Gallery before London, thanks to similar private munificence to that which is about to endow the Metropolis with a building of the same kind. In 1882 the private donor referred to offered £10,000 through Mr. Maxton Graham at the Royal Scottish Academy Banquet of that year, and it is understood that the contributions of the liberal helper since must have amounted to little less than £50,000.

The building, which was opened on Monday, is erected from designs by Dr. R. Rowand Anderson, and embraces two sets of galleries similar in size and number—one set on each side of a central hall or court. Those in the east end of the building are allocated to the Antiquaries, while in the western half are the rooms for the Portrait Gallery. Dealing with the latter, which are now partially available, it may be noted that the galleries are in each of the three floors into which the building is divided. On the north, or Queen-street side, the rooms are 82ft. by 26ft., and on the lane side 62ft. by 26ft., the pair of galleries on the ground and first floors being separated from each other by a stone open-arcading, showing three pointed bays. On the top floor, which is lighted from the roof, the two galleries are divided by partition walls. On this story a handsome, well-lighted gallery has been constructed over the entrance court and vestibule. It is 43ft. 6in. square, and shows a fine coved and ribbed ceiling, with central light. On its north side is a stone arcading, separating it from an oblong gallery, corresponding to the size of the vestibule. A prominent feature of the internal arrangement of the building is the entrance hall or court, 43ft. 6in. square, approached from the outer vestibule by three doorways, and carried up two floors. The lighting is accomplished by two tiers of windows on the south side, filled with cathedral glass. This court is surrounded with pointed arches, three bays on each side, constructed of red Corsehill stone, which is used for the rest of the building. They carry on the first floor an ambulatory or pathway which traverses the four sides of the court, a protecting light rail of wrought iron being inserted between each set of piers. The floors are laid with marble mosaic, and the walls are lined with fine red brickwork. The ceiling is divided into deep panels by means of beams, and round the ambulatory on the first floor is a series of corbels carrying busts. Another noteworthy feature of the interior is the stair, which, in the case of the portrait gallery, opens off the south-west corner of the court. The several flights, broad and easy to climb, are carried on a series of moulded arches. The climb to the top in a subdued but sufficient light is rewarded by the effective sight which unfolds itself in the beautifully vaulted ceiling, the carrying arches of which, from the last landing but one, present a picturesque aspect.

The style of architecture adopted is secular Gothic of the 14th century, and when the whole façade, with its flanking towers and spires and binding ornamental parapet, is completed the building will be recognised as a notable and interesting addition to the architecture of the city. The architect in selecting this particular style was guided by considerations alike of utility and beauty—this phase of the Gothic readily lending itself to the providing of sufficient window openings for such of the galleries as required to be lighted from the side. The main entrance is in the centre of the building, and forms an effective feature of the design. It takes the form of a deeply-moulded pointed doorway, whose flanking mouldings are carried up through the first floor, and finished as pinnacles, which support a gablet rising to the eaves. Over the doorway are three panels, which are intended for sculptured designs representing the stone, bronze, and iron ages. On the first-floor level is a quadruple window, with tracery, and above it a large lunette intended for a sculptured group representing the Arts. On the ground-floor level, on each side of the doorway, is a range of four large pointed windows; while over these on the first floor is a line of smaller windows, arranged in pairs inclosed within a pointed arch. Between each double pair the intervening piers are formed into niches, with pinnacled canopies for the reception of statuary. Each corner of the building is emphasised by an ornamental octagonal tower, which anchors the edifice, as it were, firmly to its place on the ground. They are corbelled out from about half-way up the first floor, show niches upon each face, and are finished by an open balustrade and spire. This balustrade is completed at the west end, and the excellent effect it will produce when carried round the whole building may there be advantageously studied. On the façade there are no fewer than twenty-four niches, which by-and-by it may be hoped will be filled with worthy examples of contemporary sculpture. The building, as already said, is built of red Corsehill stone, so that the material for such figures as will adorn the niches should not, at all events, be of a costly kind.

Mr. A. Bruce Joy has been commissioned to execute the bust of the late Mr. Matthew Arnold, which is to be placed in Westminster Abbey.

ST. MICHAEL'S CHURCH, AND THE MANOR HOUSE, CHENIES, BUCKINGHAMSHIRE.

By Frederick George Lee, D.D., F.S.A.

WHEN the projected railways for that portion of the county of Bucks in which Chenies is situated are opened, several out-of-the-way villages and some inaccessible places of interest will be easily available for inspection and study by the archæologist and antiquary. There are numbers of places—manors, churches, mansions, and old houses, within easy reach of London, where architectural and archæological objects of interest still remain, of equal importance to Englishmen with any that may be found, whether in cathedral city, town, or village, during foreign tours or sojourns abroad. All the former, however, stand in grave danger of restoration by ambitious experimenters and un-conservative architectural adventurers, whose name is "Legion."

The manor and church of Chenies, for example, are of great antiquity. But the place itself had not been recorded in the Doomsday Survey. This village was sometimes styled "Isenhampstead Chenies," to distinguish it from the adjacent "Isenhampstead Latimers." Alexander de Isenhampstead, son of Hamon, son of Maufelin, is mentioned in an instrument as its lord so early as A.D. 1165, and the same cognomen occurs in a deed relating to lands here dated about eighty years afterwards.

On its north side the parish is bounded by Chesham Latimers, on the south by the two villages of Chalfont, on the west by Chesham Bois—a small village formerly owned by the Cheynes—and on the east by Rickmansworth.

Anciently the manor of Chenies, as its name indicates, was held by the very old Buckinghamshire family of Cheyne,* whose chief seat was at Drayton Beauchamp, about 20 miles off. Under the Will of Agnes,† Lady Cheynes, the manor and church of Chenies passed to the family of Sapcote, whose heiress, Anne Sapcote, widow of Sir John Broughton, of Northampton, married one of the political tools of Henry VIII.—Sir John Russell, afterwards Earl of Bedford.‡ She died 14 March, 1559, and lies buried here.

The Manor House in parts is of Tudor architecture. Tradition asserts that during his visits King Henry VIII. held at least two courts here—a fact very probable, but not likely to have been recorded in writing, unless the acts and deeds done were of general State importance. Many portions of the house originally consisted of timber, with lath-and-plaster between. The chimneys—of brick—were large, massive, and well-moulded, as also of good proportions. But only parts of the more ancient now remain. Two hiding-places are said to have existed in connection with a secret staircase standing between two chimney-blocks, entrance to one of which was obtained by removing two sliding panels on one side of a huge chimney corner behind a large settle. But alterations required their removal. John Leland describes the place in his "Itinerary." Here Francis, Earl of Bedford, entertained Queen Elizabeth, A.D. 1570, and it is known that he had then recently added to the old house, and greatly improved it. When the Russells subsequently moved to Wooburn Abbey, many of the old pictures were sold, with much of the more ancient furniture—then quite out of fashion. In the early part of the present century specimens were to be seen in the houses of adjacent farms, and at Amersham and in adjoining towns. I myself have examined certain of these, including the back part and head of a bedstead, court cupboards, and portraits on panel.

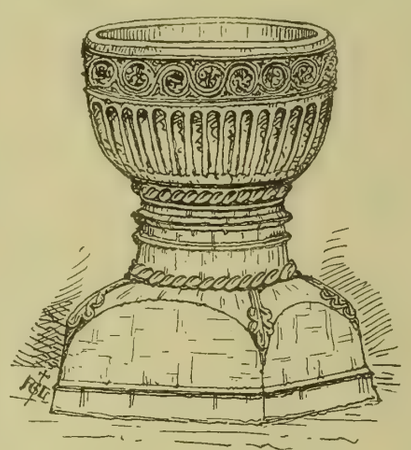
The church, which contains examples of Early English,* Second-Pointed, and Third-Pointed styles, is a fair architectural specimen—for a village—of good proportions, and picturesque. It stands on an eminence close to the old Manor House, and consists of nave, chancel, north aisle and chapel, with a southern aisle and porch, and a tower at the west end. The nave is 52ft. long, the chancel 34ft., the tower 16ft. The nave and aisles are, in width, 32ft., while the chancel is exactly 15ft. The ground plan of the tower is almost a square. In this tower hang six comparatively modern bells, cast by Mears, of Whitechapel, in 1826. These, said to have been made with the metal of those, much more ancient, hung in pre-Reformation times, are exceedingly tuneful. Inscriptions on them all commemorate the then parson, clerk, and churchwardens. The nave and aisle roofs, of oak, are mainly Third-Pointed in style, that in the north chapel being evidently of a later date — Elizabethan or Jacobean. All are in good order.

On the outside of the "Bedford Chapel," as it is termed, stands the following inscription:—

A'NO D'NI, 1556.

THYS CHAPPEL YS BUILTE BY ANNE, COMTESSE OF BEDFORDE, WYFE TO JOHN, ERLE OF BEDFORDE, ACCORDYNG TO YE WILL OF THE SAYD ERLE.

The architecture of this family burial-place is of the period—a time of decadence and decay,



Font, Chenies Church, Bucks.

when the simplicity and purity of the Third-Pointed style had given place to a rude and often coarse *Renaissance*, borrowed from Italy and Flanders, and in which heathen symbols and emblems, and an undue amount of ostentatious heraldry were far too profusely introduced. The chapel, nevertheless, is of fair proportions, and not ill-adapted to the various monuments which from time to time have found a place within its now too crowded area. The roof is solid and good. In the vault below no less than seventy members of the race of Russell have found a last earthly resting-place. Above, the memories of those of the family living during the Tudor era, are preserved in the various shields, simple, impaled or quartered; while the funeral hatchments of later periods cover the walls up above.

At the western part of this chapel remain two ancient effigies, representing a knight or warrior and a lady, carved in close-grained freestone. The lady's effigy is best preserved, but it has lost both hands and one arm. Her head, resting on a lozenge-shaped pillow, is attired in a caul, enriched by a fillet ornamented with rosettes, and buttons fasten the robe from the waist to the neck. Above this garment is the jacket, commonly then worn by women at the beginning of the fourteenth century.

The head and chest of the knight alone remain, sufficiently indicating the date of the effigy. His pointed bascinet, mail gorget, and emblazoned surcoat are of the same period. Two martlets on his breast remain, not, however, part of the Cheyne arms. Some persons suppose, nevertheless, that the figures represent Sir John and Lady Cheyne, A.D. 1400.

The earliest known presentation to the Rectory was made in 1232, as is recorded in the Lincoln Episcopal Register of that year. An account—technically "a terrier"—of the grounds and buildings belonging to the Rectory was made, and delivered into the Archdeacon of Buckingham's Court at Aylesbury 30th March, 1680. This document described a good-sized dwelling-house, "consisting of five bays of building," with outhouses, gardens, yard, and orchard. This was signed by William Burrough, Rector, and the two churchwardens. In the year 1826 the glebe consisted of twenty-eight acres, of which eight were pasture and the other arable.

The font of the church is a good specimen of First-Pointed work, with a large bowl standing on a rectangular base. The bowl has a carved band of floriated ornamentation around the top, with fluted grooves in its lower part. Cable mouldings are placed around the stem, both above and below, and at the corners of the base are sculptured conventional leaves. It is of the same type as the font in Aylesbury Church.

Much of the old stained glass which existed in the church in 1826 has been either lost, destroyed, or removed. There are, however, several fragments of interest still remaining. In



Chenies, Bucks: in an Old Cottage Window

many particulars the works of repair and restoration have been wanting, as regards sound architectural and archæological taste.

There are some interesting brasses still remaining in the church, some with figures and canopies quite complete.

1. An inscription to the memory of Sir Nicholas Smythe, parson of the adjacent village of Latimers, who died on the eve of the Feast of the Conception, A.D. 1517.

2. An effigy of a lady in a veil and flowing kirtle, to which the inscription belonging to another brass has been erroneously attached.

3. An effigy of a lady of the Broughton family, probably a daughter of the ancient house of Ellys of Aylesbury—a family allied to that of Baldwin. Shields of brass remain, one of which has the undifferenced Ellys' arms—viz., argent a chevron vert between three estoiles gules. The date of this memorial appears to be A.D. 1524. Sir John Baldwin was Lord Chief Justice *temp.* Henry VIII.

4. A brass of a priest, in the chancel, Richard Newland, rector of Chenies, who died A.D. 1494.

5. A lady, Ann Phillips, widow, habited in flowing robes, with veil and wimple, holding a heart, out of which appear two labels. The canopy, gracefully designed, is very perfect, and in good preservation, while the shields are complete. This lady appears, from the heraldic impalements, to have had two husbands.*

6. A fine brass, with double canopy, of Sir John and Agnes, Lady Cheyne. This lady, on

* Thomas Cheyne, Lord of Chenies, was shield-bearer to King Edward III. The Cheynes were one of the oldest knightly families of Bucks. Sir John Cheyne, as lawful owner and patron, presented to the rectory A.D. 1264; Sir Stephen Cheyne in 1267; Bartholomew Cheyne in 1296.

† The Will of Agnes, Lady Cheyne, is dated 24 Nov., 1494. Therein she desires to be buried in the chancel of Isenhampsted Church, i.e., Chenies. Leaves £20 for a thousand masses. To the churches of Chenies, Drayton, Beauchamp, and Cogenhoe, to each of them 20s. To the Prior and Monks of King's Langley the bequest of her husband, with numerous other gifts. To John Cheyne, of the Bois (in Chesham), her manor of Cogenhoe, &c. In the brass to her memory existing here, the dates of her death, and that of her second husband, appear to have been intentionally defaced. For genealogical details of the Cheyne family, which can be relied on, those interested may consult "Records of Bucks," issued by the local Archæological Society, Vol. I. pp. 125, 137, 236, 293, and Vol. II. p. 128.

‡ A treatise of some research and considerable literary interest, introducing "Historical Memoirs of the House of Russell," by J. H. Whiffen, may be consulted by those interested in this well-known race. The earlier portions of Vol. I., however, relating to the family anterior to the day of Mr. John Russell of Swyre, A.D. 1500, must be taken with many grains of salt. These are far too rife with fancy and romance.

* Some exceedingly interesting Early-English glass remains in the east window of the adjacent Church of Chesham Bois. Both church and glass have, however, been considerably damaged by random restoration. A brass of a Chrysom child in the chancel is also worthy of note; together with a tomb on the north side of the sanctuary.

* She was of Thornborough, Northamptonshire, and of this village—dying in 1500.

the death of her aged husband, married Edmund Molyneux, Esq., A.D. 1484. The knight is in armour, the lady in flowing robes.

7. John Walliston, of this village, with Isabella and Joanna, his two wives, A.D. 1469 (?). This brass is much worn, and the inscription imperfect. The woman to his right wears a high head-dress; the other has large lappets.

In the Bedford chapel, to the north, the monuments are remarkably interesting, and of some importance to the genealogists. There is likewise a considerable amount of old heraldic glass —i.e., of the Tudor period—in the windows of this mortuary chapel, more particularly in the centre window on the north side. Some of the more ancient shields, however, appear to have been shifted of late years; most, however, are modern. But the monuments are far beyond being described in detail within the compass of a brief paper. Amongst the chief of them are memorials to the memory of—

1. Anne, Countess of Warwick, wife of Ambrose Dudley, son of John Duke of Northumberland.

2. John, Lord Russell, Earl of Bedford; died 1554.

3. Elizabeth, Countess of Bedford, daughter of Sir John Sapcote, Knt.

4. Francis, Earl of Bedford, and Margaret, his first countess, daughter of Sir John St. John, Knt., afterwards Lord St. John of Bletsoe.

5. Sir William Russell, who married Elizabeth Longe, afterwards created Lord Russell of Thornhaugh. He died 9 Aug., 1613.

6. Lady Francis Bouchier, daughter of William, Earl of Bath.

7. Georgina Elizabeth, wife of John Russell, sixth Duke of Bedford, and daughter of George Byng, fourth Viscount Torrington.

8. Frances, daughter of Francis, Lord Russell of Thornhaugh, and Katherine, his lady.

9. Dame Katherine, Lady Russell, daughter and heiress of Giles, Lord Chandos.

10. Francis (son of William, Lord Russell), Lord Russell of Thornhaugh, died 9 May, 1641.

11. Wriothesley, third Duke of Bedford, died 23 Oct., 1732.

12. William, first Duke of Bedford, K.G., and his duchess, Anne, daughter of Robt. Carr, Earl of Somerset.

The church is kept in good order, and so is the churchyard, planted with standard roses and other flowers. The situation of church and churchyard is excellent, and their appearance picturesque. Within, the memorials of the Russell family, it may be, somewhat overpower the sacred edifice, which, without them, would be a mere simple and well-planned House of Prayer, of good but not remarkable architectural features, very suitable and fitting for the use of the villagers, who live in picturesque, comfortable, and well-kept cottages* and houses within the sound of its musical bells.

SKETCHES BY THE LATE R. C. PINK, ARCHITECT.

WE have had a look this week at the proof-plates of the memorial volume of sketches which is about to be issued to subscribers in connection with the Architectural Association as a mark of the regard in which the late Charles Richard Pink, F.R.I.B.A., is held by many members of that body. Among the few general views is a sketch of the tower of St. Bartholomew's Church, Hyde, near Winchester, taken from the author's own garden, and touched in with much artistic feeling. The building was restored by Mr. Pink, and the memorial brass to be erected to his memory by the subscribers to this volume is now being executed from the designs of Mr. Talbot Brown, of Wellingborough. Five plates of the book are devoted to the Waller Tomb in Stoke Charity Church, Hants, with carefully measured and figured details illustrating the mouldings, heraldic devices, and inscriptions, as well as some bits of stained glass, &c., in the same building. Similar studies of glass are given from Haddon Hall, Ightham Mote, and other places. Mr. Pink was particularly happy in his drawings of ornament. Thus, from Hanwell Church, Oxon, a piece of 17th-century swag work with a cherub's head between is full of "go," and so is the bear from the crest of Sir Richard Molles' tomb, Nutshalling Church. Hawstead Church furnishes an uncommonly good Italian sort of corbel, and the chimneys on the same sheet from Coldham Hall, a neighbouring house in Suffolk, are useful suggestions for brickwork. So, too, are the gable copings and apex finials from Wrotham Place, Kent, while from Lavenham the choir-screen work inclosing the celebrated Spring pew cannot fail to be appreciated. Hengrave Hall Church is represented by the Kitson monument, a work of 1602, and the next sheet gives some simple tombstones from Compton Winyates, Warwickshire, where the junction of the arcade with the lower arch supplies a curious study worthy of the note here given it. The frieze of an oak chest, "Ye Stoke," Winchester, is spiritedly drawn, and is in good style, and so is the central panel of a chest from the same place, on another sheet near this last one. The bench-end poppy from Ightham Mote Chapel is a fine Tudor specimen, and the plaster panel from an old house in the High-street, Canterbury, though much later, is very good indeed. By no means the least interesting part of South Wraxall Manor House is its detail, and Mr. Pink has sketched, among other things, the spandrel carving from one of the chimneypieces very charmingly. A niche from the Holy Ghost Chapel, Basingstoke, is a specimen of mixed Renaissance and Gothic, familiar at Layer Marney, Essex, and a tower pier from the same is another good "bit" to refer to. Winchester Cathedral, Lawrence Magna, Hardwick Castle, Derbyshire, Bolsover Castle, Ashby-de-la-Zouche, Cold Ashton, Truston Church, and Bakewell Church are among the subjects of the other sheets of this highly interesting volume.

* An illustration of a curious and perhaps unique flowered quarry, still remaining in one of these, is given in the accompanying wood-cut. Its outline is of dark brown, the shaded portions being tinted in yellow.

A SANITARY TOWN HOUSE.

A NUMBER of sanitary experts and gentlemen connected with scientific journals paid a visit last Saturday to No. 5, Queen's-gate, Hyde Park, the residence of Dr. Thomas Wakley, proprietor of the *Lancet*, for the purpose of inspecting the drainage system and sanitary works carried out there under the direction of Mr. Rowland Plumbe, F.R.I.B.A., the architect. The house is a spacious town house of the terrace type, and has been built many years. The sanitary arrangements were found to be quite out of date, and to belong to the old plan of unventilated pipes and sealed drains. These Mr. Plumbe speedily condemned, and in their place has substituted a complete system, based on the true principles of sanitary drainage, which has been carried out by Messrs. Hanks, of Berners-street, Oxford-street. The old earthenware pipes which ran under the basement passage were taken up, and their place supplied by cast-iron socketed water-main pipes 5in. in diameter and in 9ft. lengths, coated with Dr. Angus Smith's solution. This main drain through the house is laid to a good fall in a trench, still unclosed at the time of our visit. We noticed that the pipes are bedded on a layer of concrete, and that the joints are caulked with lead, in the same manner as water-mains are jointed, with 4in. branch pipes. In the vault below the entrance porch this line of main-pipe drain passes through a ventilated chamber lined with white glazed bricks, the drains being carried through in glazed channels. A Phillips No. 2 pattern 6in. intercepting trap is provided at this end next the sewer. Two similar chambers or manholes are provided, one at the other end of the drain, and one intermediate, where the soil and other pipes in the centre of house join the main drain. It was of importance that these manholes should be ventilated, and the means taken to effect this object are perfect. Broad's air-tight manhole covers are fixed in the manholes, 7in. of silver sand is pressed down, and over these are fixed Phillips's Brontes patent cast-iron air-tight frames and flaps. There are thus three checks to the escape of sewer gas, but, besides this, the manholes are ventilated. In the small yards we find that the rain-water and sink waste-pipes discharge over Doulton's trapped surface gulleys. At one end of main house drain an Adams and Co.'s 15-gallon combined grease trap and automatic flushing tank, easily accessible from area, is provided, thereby insuring a thorough flushing of the drain every time the kitchen sink is filled. Our attention was next drawn to the closet and water arrangements. The soil-pipe is carried up to the roof and left open at the top; this, together with the inlets below, create a current of air throughout them. Each closet has also a ventilating-pipe to the trap, and another under the valve, so that no gas can possibly accumulate within or under the apparatus. Dent and Hellyer's "Optimus" closets, with separate water cisterns, are fixed so as to keep the water supply of house separate from the closet service. The water pipes are connected to the fire main to insure a constant high-pressure supply of water. One of the precautions taken is to provide a stop-cock to every single cistern, bath, and wash-hand basin, in addition to the ordinary taps, so that any pipe or cock can be shut off when necessary; there is also to every cistern, sink, w.c., bath, &c., a lead safe and outlet pipe discharging outside. The cisterns are supplied with filters from the London Water Purifying Company.

The visitors' attention was called to the general decorations of the house; one of the reception rooms, called the Yellow Room, has been papered with a rich golden-hued paper, painted, that can be washed—the "Anaglypta." The Lincrusta and other improved and washable papers have been employed. Parquet-flooring, by Messrs. Bassant, is to be laid to the reception rooms, and Ashton and Green's slow-combustion stoves are fixed. The whole of the house is being fitted for electric lighting, the power being supplied by the Kensington Court Company, the fittings being by Messrs. Laing, Wharton, and Down, under the direction of Mr. Rant. Mosaic paving to hall is by De Grelle, Houdret, and Co., the painted windows by Mr. Arthur J. Dix; Mr. Herbert Banks being the general contractor, under Mr. Rowland Plumbe, the architect.

SOCIETY OF ESTATE CLERKS OF WORKS.

THE first anniversary and annual dinner of the above society was held at the Mona Hotel, Henrietta-street, Covent-garden, on Tuesday, July 9th. A good number of members from various parts of the country attended, and many friends in the metropolis were also present at the dinner. Mr. H. J. Shillito presided on the occasion, and "The Success of the Society" was proposed in a humorous speech by Mr. G. A. Williams, and enthusiastically received. The Secretary, Mr. T. Potter, read the annual report, from which it appeared that the society was making steady but certain progress, its members being distributed over 26 counties in Great Britain, and that land-owners and land-agents were giving it support by becoming honorary members in the belief that the dissemination of practical information in connection with landed estate works was a matter of as much importance to the estate owner as to the estate clerk of works. A benevolent fund for assisting the members or their families in case of need was decided upon, and a proof of the business way in which the members had established and conducted the society hitherto was evinced from the statement that, although no donations had been solicited or received, and no subscriptions, except those of members and honorary members, were needed, the assets were considerably in excess of the liabilities—a somewhat unique occurrence in the early history of similar associations.

MILLAR'S PATENT REVERSIBLE AND SLIDING WINDOW.

THIS patent sash has been invented by Mr. James Millar, of Newcastle-upon-Tyne, and has the original and novel feature of having reverse rebated, water and airtight joints, hinged at the vertical centres of the stiles, thereby securing absolute ease and safety in reversing the sashes, outside-in, for cleaning, painting, and glazing, they being self-balanced, and no matter what size or weight of window, the process of reversing is quite as easy in the largest and heaviest of sashes as it is in the smallest, thus obviating the acknowledged danger in reversible windows which are hinged or pivoted at the bottom of the sashes, through the liability (especially in large and heavy windows) when reversing, of the whole weight of the sash pressing upon the person about to clean them before it is brought down to the requisite position, thereby causing certain risk to the operator, not to mention breakage of large and valuable squares of glass. In Millar's patent sashes it will be obvious, on examination, that all

the above objections to reversible windows are overcome.

There are other advantages claimed for this sash, one of which is the perfect system of ventilation obtained; another important one being that this patent can be applied to existing sashes at a nominal cost, and without in any way interfering with their structural arrangements. There is no gearing or other apparatus attached to them to get out of order, being simply worked on hinges, with check joints, and a simple lock or bolt connects the stiles together. We may mention that these windows have been largely adopted both in London and in the provinces. Full-size windows, with fittings suitable for hotels, hospitals, asylums, schools, mansions, &c., &c., may be seen at the works and showroom of Millar's Patent Reversible Window Co. (Limited), 128A, Euston-road, N.W.

MASONRY AND STONE-CUTTING.*

By LAWRENCE HARVEY.

[TWENTY-THIRD LESSON.]

DOMED-UP GROINS.

I HAVE reserved the question of *domed-up groins* to be treated after that of *pendentives between pointed arches* because, although nominally groins, they are surfaces of the same nature as the pendentives studied in our last lesson.

We have in London an example of groining, formed, according to classic principles, by the intersection of elliptical and circular cylinders, and an example of domed-up groining at but a few hundred yards' distance from one another. The first is the vaulting over the carriage-way of the Horse Guards, the second is the vaulting over the side passages to the carriage-ways which give access to the courtyard of the Foreign Office. I believe that anybody who studies carefully these two examples will have no difficulty in concluding that the domed-up groin construction is infinitely neater and more sightable than the classic construction of the Horse Guards.

Sir Gilbert Scott, the architect of the Foreign Office, gave in his lectures at the Royal Academy the following system for producing these domed-up groinings (Fig. 142):—On the plan of the larger vault, of span C D, we draw the groin lines A E and B F, the elevation of which is the semi-ellipse A′ Y′ B′. Then, the surface of the cell between the groins will be generated by moving the centring of the face arch A B parallel to itself, and guided by the groin lines with which it will be bound to remain always in contact. It is what in geometry is called a *channel surface*—that is, the path of a solid or a curve moving through space.

To draw the section through the centre line of the small arch we place on plan a series of successive positions of the centring, such as M, N; P, Q. By plumbing upwards we get the points M′, N′; P′, Q′, where the centring would touch the groin when placed in these positions. Taking the height R S of the crown of the arch above the line M^2 N^2, and carrying it on the left-hand section in its proper position we get a point of the curve formed by the crown of the cell. Sir Gilbert Scott tells us it is an ellipse, and sometimes the ellipse is so strongly marked that it is unsightly. This occurs when pointed arches are used.

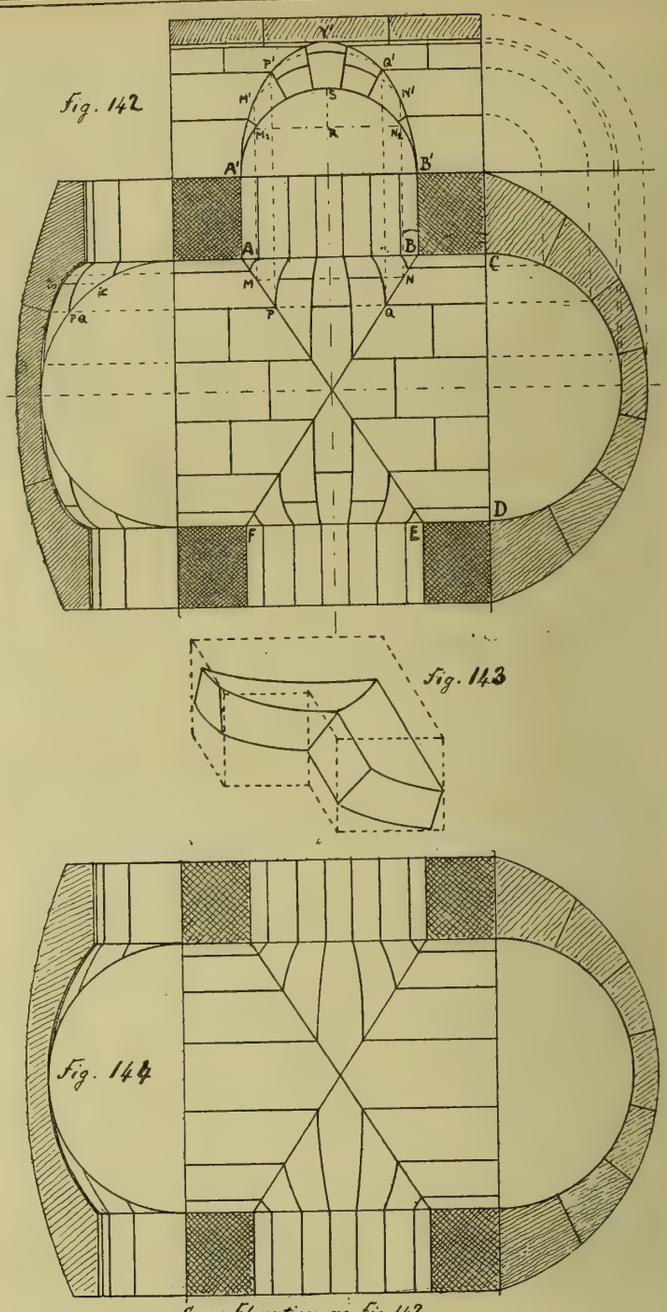
To draw the joint lines of the vaults, we begin by dividing the section of the larger arch in an equal number of stones, and draw the bed-joints of that vault on plan and elevation up to the groins. Then, starting from the points where the joints meet the groins, the joints of the smaller arch are drawn on elevation radiating from the centre of the arch (this does not give equal divisions for the stones of the small arch). Each bed-joint being a plane, by marking its intersections with the several positions of the centring, we obtain points on plan which give the curve formed by the joint. These bed-joints can also, by similar means, be delineated on the left-hand section.

The cross-joints which separate the several stones of each course will follow the lines of the centrings; the surface of these joints may be formed as conical zones on the same principle as the horizontal joints of the pendentive, Fig. 130, Twenty-first Lesson.

To work the stones we shall have to get the moulds of the bed-joints of the small arch, which we do as usual by turning down the beds round the centre line of the arch.

In cutting the stone (Fig. 143) we square off the plan of a stone which will contain the arch stone, as we have done in the "Return Angle of Cloister" (Fig. 84), Fourteenth Lesson. The part of the arch stone which belongs to the larger arch is, of course, worked in the usual way, as in cylindrical arches; but for the branch which belongs to the smaller arch, we begin by delineating the arrises of the joints on the plane of the beds. This we do by the help of the bed-moulds. Then we work the channel surface which forms the soffit of the stone. We produce this by means of a zinc template cut to the curve of the arch, and which we move parallelly to itself along the bed-joints previously delineated.

In the Foreign Office archways, it will be observed that the stones which form the groins offer a broad soffit on one side, and a very narrow one on the other. This is certainly unsightly. To disguise it, Sir Gilbert Scott has had a painted rib decoration stencilled in distemper along the arrises of the groins. Of course in Mediæval architecture, with specially constructed projecting ribs, this difficulty does not occur, and the soffits of all the arch stones which fill the cells within the ribs may be of the same width.



(Fig. 144.) The cells of Gothic vaulting are often filled with skew surfaces generated by the motion of a straight line bound to touch the face arch and the groin, sometimes bound, as a third condition to determine its motion, to remain always horizontal, but in English vaulting remaining parallel to a line which is approximately at right angles with the line which bisects the angle formed by the groin and the face arch at their springing. Can we use such a surface here, where round arches are used?

Let us try a skew surface of the nature of a cow's horn. The cell would then consist of two skew surfaces, each guided by the centre line of the face arch, but also by the opposite halves of the face arch, and by the opposite groins. These surfaces will be continuous if on the generator which they have in common they have in three points the same planes tangent in common to each surface. 1. Where the generator meets the centre line of the face arch we know that the plane which contains the generator and the centre line is tangent to both surfaces. 2. At the crown of the face arch the plane which contains the generator and the horizontal tangent to the face of the arch is a plane tangent to both surfaces. 3. But, where the groins meet at the crown of the larger arch, the planes tangent to

* All rights reserved.



each surface contain the generator and the tangents to each groin line; these planes do not coincide, but meet in an angle on the generator. We conclude, therefore, that the surface of the cell would present a projecting arris, more and more marked as it neared the crown of the vault.

On the other hand, if we strike an arc of a circle X W Y on the section, passing through the crowns of the two opposite face arches and the point where the groins meet, then use this arc instead of the straight generator of the cow's horn described above, we shall produce a continuous surface like that of the pendentive, Fig. 138, Twenty-second Lesson. This surface is easy to work, and is to be recommended where large stones are used. As to working the stone, what we have said of the pendentive (Fig. 132) applies here, and need not be repeated.

PORTABLE WICKER OR CANE BATH FOR HOT AIR, STEAM, OR SULPHUR.

MESSRS. CONSTANTINE AND SON, of Oxford-street, Manchester, of the Convoluted Stove notoriety, who have contributed materially to the efficient heating and ventilation of Turkish baths, have patented this bath, which will be a valuable addition to any household, especially when sickness occurs.

In modern as well as in ancient times it would seem that there must be a Constantine prominently connected with the Turkish bath. Mr. Constantine, sen., has had over forty years' experience as bath proprietor, and has frequently been engaged by the medical profession to give sweating baths to patients in the sick-room. He has felt the need of such a bath as this one. The cane-bottom chair has frequently been made use of. Now and again a rough framework—a sort of crinoline—has been utilised: necessity has ever been the mother of invention. The advantages of this bath are:—

1. It may be used in any bedroom, or in an ordinary bath-room, and may be removed to a spare room, it being of light weight.

2. The patient, while undergoing the sweating process, is in an easy reclining position. Sitting erect in a box for twenty or thirty minutes wearies a patient.

3. The feet are elevated sufficiently from the floor to allow the heat to get well to them. If the circulation is promoted in the feet, and they are made to perspire equally with the other parts of the body, a rush of blood to the head is prevented, and this is important.

4. The heat being delivered well about the feet, it ascends and plays equally on all parts of the body.

As this bath will not only be effective for producing perspiration, but cheaper than any others now in the market for this purpose, it ought to be in great demand.—*English Mechanic.*

THE THICKNESS OF PARTY-WALLS.

CONSIDERABLE discussion is prevalent at Coventry with regard to the thickness of party or division-walls. Public attention was called to the question a short time ago by the refusal of the Coventry Board of Guardians, acting as the Rural Sanitary Authority, to pass certain plans for small tenementary property on account of "insufficiency of thickness of party walls." It was stated that the by-laws declared all "party" walls should be 9in. in thickness, whereas the plans submitted only allowed for 4½in. walls between each house. The surveyor, Mr. T. W. Whitley, explained that it had for some time past been the custom of the Rural and Urban Authority to pass plans with 4½in. division-walls. The board passed a resolution that in future party or division-walls between all new houses should be at least 9in. thick throughout, and that the by-laws relating thereto should be enforced. Owing to dissatisfaction with the action thus taken, Mr. Goate, a member of the board, gave notice at the last meeting to bring forward a motion rescinding the by-law.

The subject was brought before the Coventry City and Council on Tuesday, by Mr. Councillor Loudon, who is also a member of the Board of Guardians, and a strong advocate of 9in. walls. He moved that the enforcing of the by-law requiring the external and party-walls of new buildings to be of hard and incombustible substances, and of the thickness of at least 9in. in respect of dwelling-houses, should be taken into consideration by the General Works Committee. His own personal experience was that 4½in. walls were an abomination which should not be allowed. According to the opinion of sixteen authorities throughout England, there were two different ways of defining the by-law. One of these definitions was that party-walls were only meant to be the walls between properties belonging to different owners. This he considered complete nonsense. The other definition, that the wall between every house should be 9in., was common sense. Under the present system of passing plans, a speculative builder, in putting up 20 houses, would only be required to make the two external walls 9in. in thickness, and all the other 19 might be only 4½in.; yet, in twelve months' time, each of the 20 houses might belong to a different owner. If 20 different owners built 20 different houses, the surveyor would not pass one of the plans unless 9in. walls were provided between each house. It was said that if all the party-walls were 9in. in thickness, rents would be increased, while the rooms would be smaller. This he regarded as having but little bearing on the subject. Supposing that a builder erected two houses with 9in. party-walls, and another builder erected two others with 4½in. walls, the difference in the cost would only be £7 2s. This at 5 per cent. was not more than 7s. 6d. per annum.

Councillor Laxon seconded the motion, and Councillor Andrews asked if a party-wall meant a wall between two houses or between the rooms of the same house. In reply, Mr. Loudon read the Local Government Board's definition of a party-wall: "A wall forming part of a building, and being used and constructed to be used in any part of the height or length of such wall for separating two adjoining buildings belonging to different owners, or occupied or constructed or adapted to be occupied by different persons." Ald. Matterson was disappointed because Mr. Loudon had argued only from the expenditure point of view. That might be left to the builders to settle. It was not possible to have 9in. walls without very considerably increased cost; he understood that with an ordinary two-story house the extra cost would be £10, therefore in twenty houses it would be £200. Besides, the present plan worked very well, and there were no sanitary reasons for the proposed change. The only objection was that sounds came through; but there never had been any serious objection from the occupiers of the classes of houses referred to. If the rule were enforced for 9in. walls, it would act against the speculative builder, who had to consider every item of cost, and he thought the Council ought to encourage the building of new houses in the suburbs of the city, where people could get more air, light, and freedom.

Alderman Marriott, as a practical builder, said 9in. walls would not prevent sound penetrating, and with regard to protection from fire, unless the walls were run up to the roof, the spread of fire could not be prevented. In both cases it would be necessary to have two 4½in. walls filled in with sand, and this would be very expensive.

Councillor Haywood, also a practical builder, considered the whole of the by-laws, which had been made for thirty years, ought to be gone through and modified. He proposed that the by-laws as a whole should be referred to the General Works Committee.

Councillor C. J. Hill seconded, and with Councillor Loudon's acceptance, the whole matter was referred.

WEAR OF RAILS.

THE destruction of rails by excessive weights is the subject of a paper read before the American Society of Civil Engineers by Mr. Joseph T. Dodge, C.E. It is well understood that the wear of railroad metals is largely due to the flow of metal under the great weights constantly passing over them. The slower the speed, the greater the destruction that takes place. Thus on the rails of a fast-speed section, no lip is perceptible on either rail, but on like rails for slow speed the lip is visible. Thus wheels carrying excessive loads may pass over rails at a high speed without injury; but if the speed is slow the rails will show signs of flow. We observe this at all stations where trains slacken speed. The remedies proposed are various. Some engineers think that the strain or load should be reduced; others that the rail should be made stronger, or the head be widened. The cause of flow is no doubt owing to the metal taking a set; the elastic limit is exceeded. The chief object to be attained is to make the rails' contour agree with that of the wheel, or to roll their heads to a form which is found to agree with the shape they take after some wear.

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ILLUSTRATIONS.

TOMB OF CARDINAL FORTEQUERRI DEL VERROCCHIO, PISTOIA CATHEDRAL.—THE VICAR'S CLOSE, WELLS.—NO. II. BAYSWATER HILL, W.—CHILDREN'S CONVALESCENT HOSPITAL, CHEADLE.—FARM HOUSE, HENDON.—AN INGLE-NOOK AND CABINET, BY W. WALKER AND SONS.—HOME ARTS AND INDUSTRIES EXHIBITION SKETCHES.

OUR LITHOGRAPHIC ILLUSTRATIONS.

TOMB OF CARDINAL FORTEGUERRI AT PISTOIA.

THIS group of sculpture from the celebrated sepulchre of the great Cardinal Niccolo Forteguerri in the Duomo at Pistoïa was designed by Andrea del Verrocchio, the master of the more famous Leonardo da Vinci. His model for the monument is now in South Kensington Museum. It was submitted in 1474 in a limited competition, and the Council greatly favoured Verrocchio's design, but the price which he named for its execution was considered too high. While this deliberation was going on, another artist, Pierro del Pollajuolo, sent in a model which arrived, however, just in time to be too late, for Verrocchio obtained the commission. The final choice was not confirmed without considerable difficulty, seeing that the family of the Cardinal did their utmost to upset the award. They did not succeed, and Andrea's composition was commenced. Though probably never really finished, he is no doubt the author of the figure of "Hope," and the sculptured relief of the Saviour in a vesica piscis, surrounded by angels, which adorn the monument. The tomb was completed in a heavy and inharmonious style by Lorenzetto or Lorenzo Lotti, assisted by Gaetano Mazzoni. The work is situated in the chapel on the left of the choir of Pistoïa Cathedral, and is thus set in the finest Cinque Cento style of architecture, near the tomb of Bishop Donato de Medici, not far from the Font by Andrea Ferrucci da Fiesole, which is covered with rare sculptures. Our illustration is reproduced from a large detailed photograph.

THE VICAR'S CLOSE, WELLS.

THIS drawing, taken from the Cathedral overlooking the Vicar's Close at Wells, is one of the series for which Mr. C. E. Mallows was awarded the Pugin Travelling Studentship for 1889. We hope shortly to give others from his pencil. We gave a plan of these Close buildings, with some views and details, in the BUILDING NEWS for July 20, 1883, when a full description of the place accompanied our drawings.

NO. II. BAYSWATER-HILL, W.,

OR, as it is now called, Kensington House, Bayswater-hill, has just been erected for Mr. J. Newton Mappin, from the designs and under the superintendence of Mr. Wilfred J. Hardcastle, of Lancaster House, The Savoy, W.C. The site is a very choice one, with a frontage of 50ft. to Bayswater-hill, facing one of the principal avenues of Kensington-gardens, over which all the front windows have an uninterrupted view. The depth of the site is such that there is a pretty garden with space for a tennis court behind the house, and beyond this the stables, containing two double coach-houses, two loose boxes, and four stalls, with living-rooms over. The elevation of the stables as seen from the house is particularly picturesque. The ground floor of the house contains to the front a library and morning-room, and to the back a billiard-room and dining-room, the latter with an oak dado, 5ft. 6in. high. The feature of the house, however, is the hall, about 28ft. square, and two stories high, with an oak dado 8ft. 6in. high; round this hall there is a wide gallery at the first-floor level to which access is obtained by the principal staircase, also in oak, which ascends in a recess, measuring 15ft. by 15ft., on one side of the hall; over this staircase there is a large skylight. The drawing-room, a fine apartment measuring 50ft. by from 20ft. to 29ft. wide, occupies the whole of the front of the first floor, the windows opening on to a wide balcony looking over Kensington-gardens. The hall and all the rooms mentioned as yet have parquet floors. The bedrooms, of which there are about 16, are mostly large, and an ingenious plan has been adopted by which the bay windows are partially screened off from the rooms so as to serve as boudoirs. The basement floor, containing the usual offices, is remarkably light, being really only half underground, and all the walls being built with glazed bricks. There is a good and light service staircase from the basement to the top of the house, and a lift for dinner, luggage, coals, &c. A large number of firms were employed during the course of the works, the principal contractors being Messrs. Higgs and Hill, E. C. Howell and Son, and E. Lawrence and Sons. The parquet came from Mr. Bassant, of Charlotte-street; the sanitary fittings from Messrs. Doulton and Co. Mr. James Snook was the clerk of the works.

CHILDREN'S CONVALESCENT HOSPITAL, CHEADLE.

THIS hospital was built as an addition to the Royal Asylum. The walls are of red brick, and the roofs are covered with red Staffordshire tiles, the gables being filled in with modelled plaster. Messrs. Bell and Roper, of Manchester, were the architects.

FARMHOUSE, CHURCH END, HENDON.

THIS building is now being carried out for Mr. C. F. Hancock, of Hendon Hall, to complete the fine range of buildings already erected, and forming a dairy farm, standing in the lane leading to Mill Hill, by the side of the picturesque old village church. The object having been to form a model dairy farm, great care and very considerable expense have been gone to in order to achieve this object. The block of buildings contain large cow-houses, barns, provender stores, and various necessary offices; cart-house, stabling, engine and machinery houses, dairies, foreman's cottage, which, together with the farm-house now being built, will form a very complete and perfect set of buildings. The materials used are hard red bricks externally, chiefly lined within with glazed bricks; Broseley plain tile roofs, Wilkinson's concrete paving; the materials of the house harmonising with the remainder. The builders for the whole of the works are Prestige and Co., of Cambridge Wharf, Pimlico, who have carried out the works under the direction and from the designs of J. T. Wimperis and Arber, architects, of 25, Sackville-street, Piccadilly, W.

SWINDON NEW TOWN PUBLIC OFFICES.

THIS building, which we illustrated last week, is now about to be commenced, subject to the approval of the plans and estimate by the Local Government Board. The design was selected in a large competition, and is by Mr. Brightwen Binyon, of Ipswich. The tender of Mr. John Reed, of Plymouth—£7,762—has been accepted subject to the approval of the Local Government Board, as stated above. The building will be situated between Old and New Swindon, and is arranged with a view to the future addition of a large public hall. The walling will be of red brick, with Bath-stone dressings, and the whole building will be of fireproof construction.

The members of the "Quatuor Coronati" Lodge of Freemasons will visit St. Alban's Abbey on Saturday next, and the tomb of the Strong family in St. Peter's Church. This body devotes its attention to antiquarian matters and old documents.

INGLE-NOOK IN DRAWING-ROOM.

THE subject of this illustration is designed to occupy the entire end of the drawing-room of a gentleman's house near Sheffield. It is executed in rosewood and inlay, and bevelled glass is freely used for mirrors and fronts of cabinets. The cove over central portion and the panels in the wings are decorated with painted ornament on canvas. The cabinets are fitted up inside with glass shelves, and lined with a neutral blue silk, fluted. The two angle lounges next fireplace, as also the two end ones, are covered with figured material, and are backed up with blue silk to match that inside cabinets. Hand-painted tiles are arranged for fireplace, and Sienna marble for fender and slips; the hearth is tiled. The whole has just been completed at a cost of about 250 guineas. Messrs. Walker and Sons, of Bunhill-row, have carried out the work. We understand that they have just fitted up the Pall Mall branch of the London Joint Stock Bank in Spanish mahogany, also the Leadenhall-street branch of the same bank, both under Mr. Creese Harrison, architect.

HOME ARTS AND INDUSTRIES EXHIBITION.

ON June 28th we gave some sketches from the above exhibition, and to-day there will be found amongst our illustrations further sketches from the same source.

The massive Oak Chair, which comes from the Gorebridge Class, is an example of the good feeling which is promoted by this Association between the classholders and the members. In this instance the chair is a presentation from seven of the members who made it to the father of Miss Dundas, the classholder. It is well and solidly made, and is suitably carved, the panelled back being flatly treated, and would not interfere, as is too often the case, with the comfort of anyone occupying the seat. The sketch will sufficiently show the nature of the carving. The Screen from Stepney, made in American walnut, is flat and broad in the matter of carving, and not without merit, though we think that the difference in scale between the designs in the upper and lower panels a little unfortunate, especially as the bolder ornament occurs at the top. But the whole thing does much credit to the five working lads who executed it. Their names are J. Lewis, A. and C. Witpen, A. Porter, and W. Witpen.

The small Tea-Table from Ellesmere is made in oak, by David Dewry, aged 21. It makes a picturesque object, and its utility nowadays is unquestionable.

Very much did we admire the little Steel Poker made by a working man belonging to the Iffley Class. It is nicely wrought and of good design, being, indeed, copied from an old example in a German museum.

The small Copper Tray, from Mr. J. W. Oddie's class at Lyzwick Hall, Keswick, is also a good piece of workmanship by J. C. Martin, and the design, which is a Hungarian diaper, looked extremely well in the bright metal.

ROYAL ACADEMY.—ADMISSIONS TO ARCHITECTURAL SCHOOLS, JULY, 1889.

STUDENTS, UPPER SCHOOL.—A. Mackintosh, L. Martin, J. C. Watt.

STUDENTS, LOWER SCHOOL.—A. W. Hoskings, W. C. Howgate, H. E. Kirby, W. S. Taylor, A. F. Usher, H. A. Woodington.

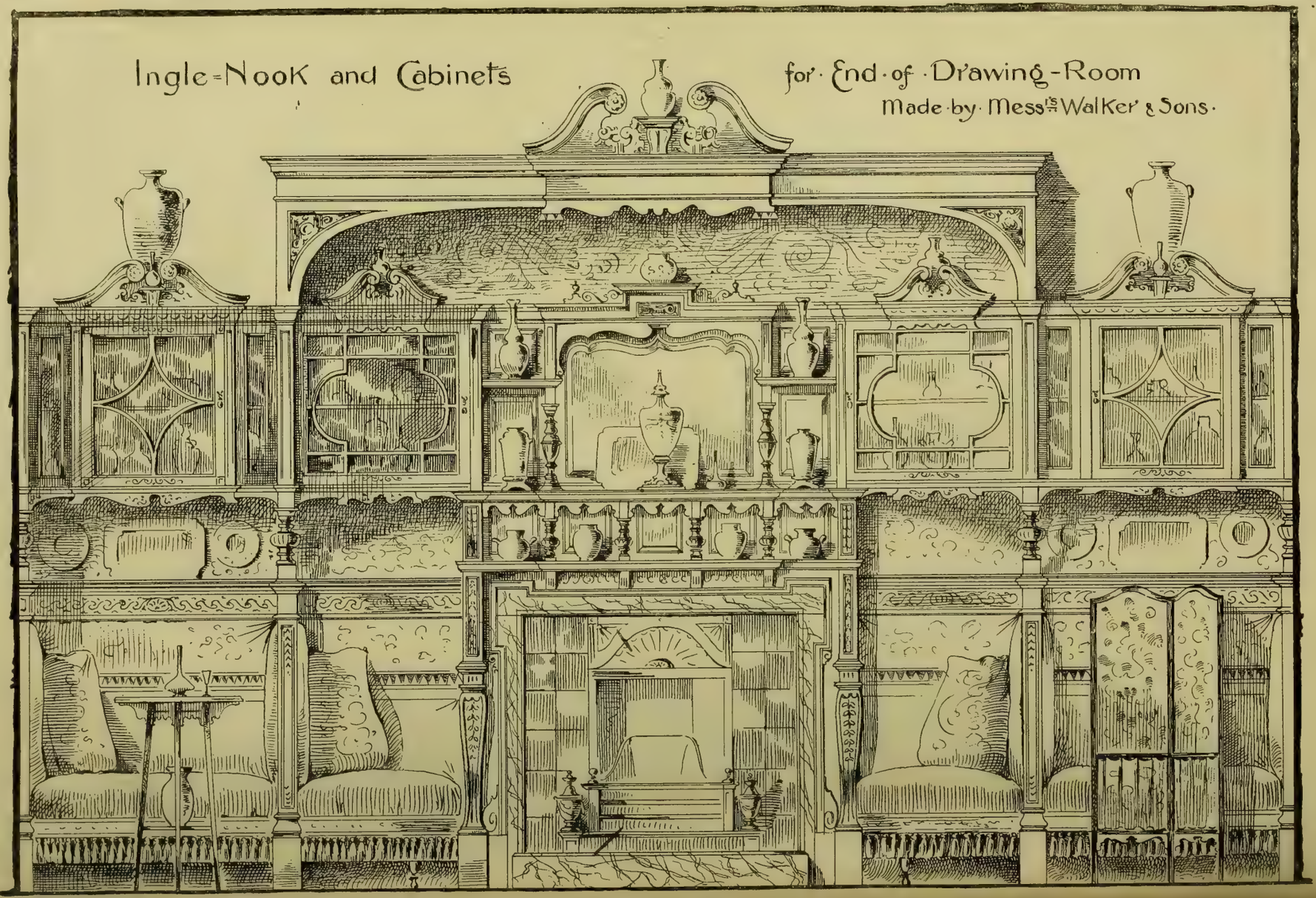
PROBATIONERS.—C. W. Baker, C. Bywater, A. J. Edwards, E. J. Gibson, S. M. Herbert, R. S. Lorimer, H. L. Paterson, R. A. Reid, P. D. Smith, J. S. Stewart, G. Streatfield, H. Tooley, A. B. Yeates.

The Right Rev. Bishop Barry, D.D., formerly Principal of King's College and late Primate of Australia, on Thursday, the 11th, presented to the students of the general literature and engineering departments of the college the prizes won by them during the year. The Jelf medal in the engineering department was gained by C. E. Jones, the Clothworkers' exhibitions by P. Hawkins and W. R. Smith, and the Sambrooke exhibition by F. O. Stanford. The following students were recommended for the Associateship:—Messrs. R. Whittington, S. H. Barratt, C. E. Jones, C. J. Mittelhausen, R. H. Rose, and Alfred Schwartz.

A new bell recently placed by Lord Grimthorpe in the north-east turret of the north transept of St. Alban's Cathedral was dedicated to public use by the Ven. Archdeacon Lawrance on Tuesday evening. The new bell was named "Edmund."

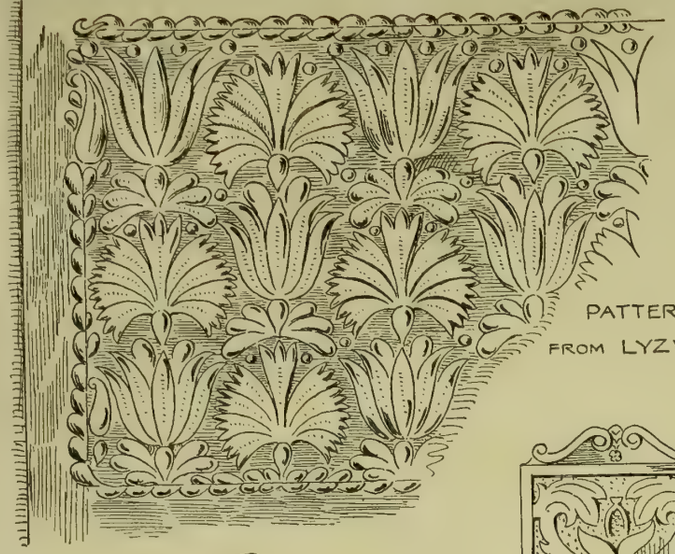
Ingle-Nook and Cabinets for End of Drawing-Room

Made by Messrs Walker & Sons

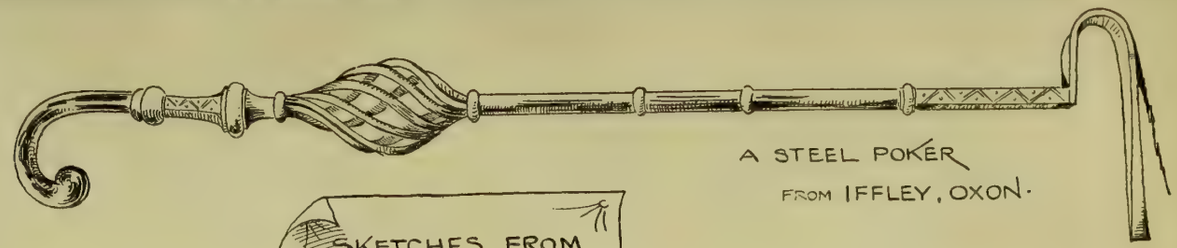


E. CHANCELLOR, DELT. JUNE 89

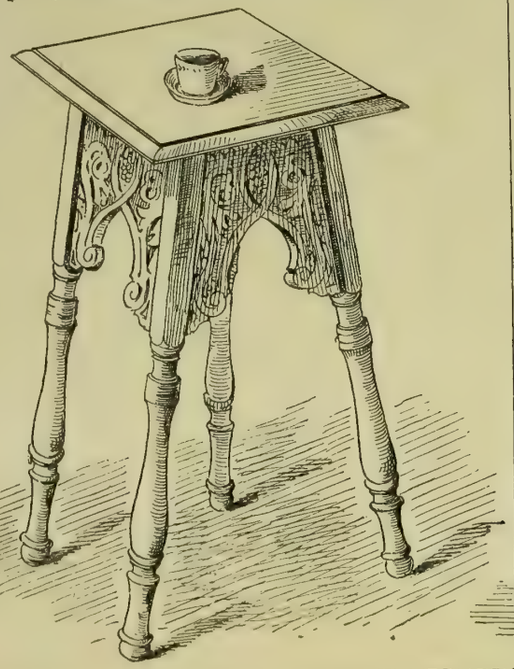
SKETCHES FROM THE EXHIBITION OF THE HOME ARTS AND INDUSTRIES ASSOCIATION AT THE ALBERT HALL



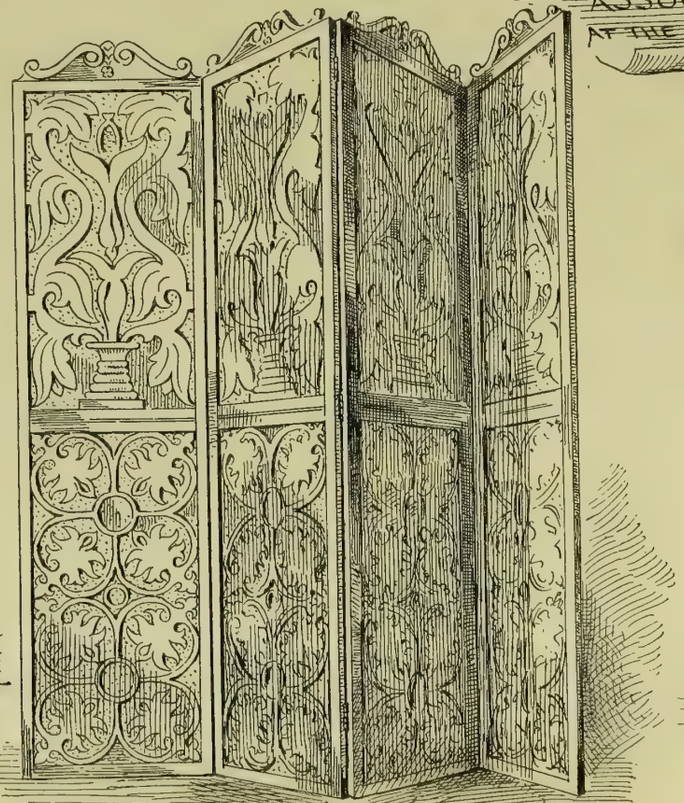
PATTERN ON COPPER TRAY
FROM LYZWICK HALL, KESWICK



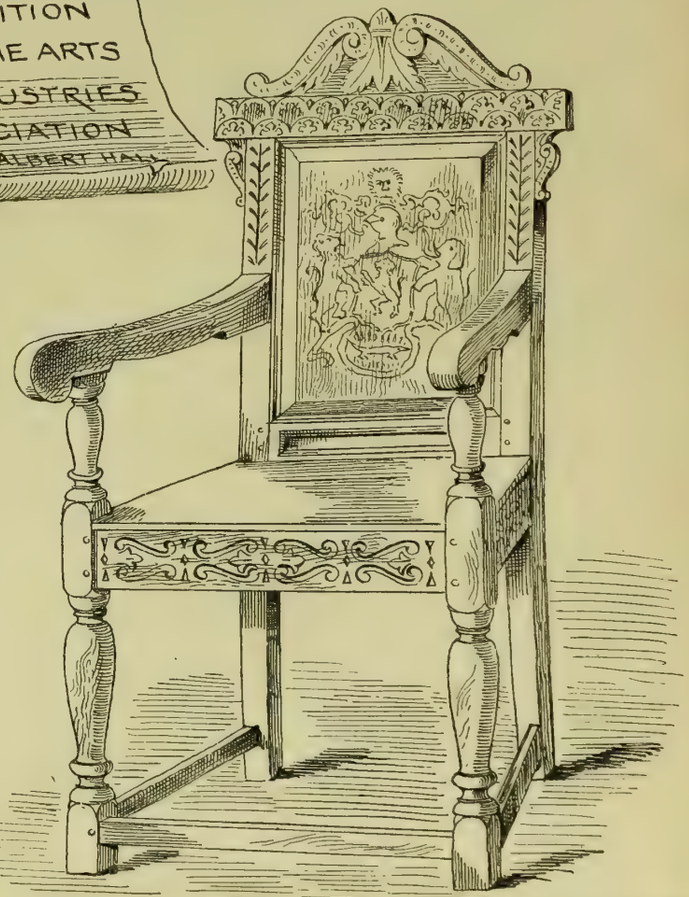
A STEEL POKER
FROM IFFLEY, OXON.



FIVE O'CLOCK TEATABLE FROM ELLESMERE



FOURFOLD-SCREEN FROM STEPNEY



OAK PRESENTATION-CHAIR FROM GOREBRIDGE, N.B

E. CHANCELLOR, DEL. JUNE '89

WAYSIDE NOTES.

DR. ROWAND ANDERSON'S great work, the Scottish National Portrait Gallery, was opened to the public on Monday, and will rejoice the hearts of those yet tied to the skirts of the Gothic Revivalists. Although not yet completed, the gallery has been well stocked with exhibits of one kind and another, such as are calculated to illustrate and render more intelligent the past history of Scotland. It is a building worthy of Edinburgh, and Edinburgh may be said to be worthy of the building; for the care bestowed upon the condition of the atmosphere of the Scottish capital makes it worth while to spend money on its architecture. There is no difficulty in the way of the ordinary pessimist's arguing that architecture is more often than not a mere vanity in London; but in Edinburgh our murky atmosphere is conspicuous by its absence, and an architect may employ unglazed materials for external walling without fear of those disastrous consequences which we here have become resigned to look upon as necessary evils.

It is curious, not to say instructive, to note that both the National Portrait Gallery for Scotland and that proposed for England are the result of private munificence. With the inauguration of the Edinburgh institution on Monday we were made acquainted with the fact that the princely gift of £50,000, with which the building was, for the most part, erected, was made by Mr. J. R. Findlay, the proprietor of the *Scotsman*. The Government, it is said, gave £10,000. Marked is the contrast.

The *pros* and *cons* of the contract system and of the "no-contract" system of building have been much discussed at various times in these columns. Towards the end of last week the subject cropped up in Parliament. Mr. C. Graham inquired of the President of the Local Government Board whether it would not be desirable for all works that come under the authority of the London County Council to be executed on the no-contract system? Such works as paving, sewering, road-making, &c., it was argued, might be better carried out by the Council itself, without the intervention of the contractor. We know that there are many cases where this plan might be adopted with great benefit to the things done or produced. But in works such as those within the scope of the County Council it is difficult to see what real benefit would result. It is no proof of the desirability of making this change in the order of things at Spring Gardens that, as Mr. Graham said, the Lambeth and St. James's Vestries employ no contractors. Mr. Graham should have produced some guarantee that the system followed by the vestries named is for the weal of the ratepayers, before he essayed to question Mr. Plunket on this score.

It is generally supposed that, presuming that contractors are honest, only on a point of artistic excellence is it a benefit that no general contractor should be employed. Pure constructional works may be carried out with more economy on the contract system. Such matters as road-making, sewering, and paving are scarcely susceptible of improvement artistically. The ordinary works of the County Council are the least suitable to the no-contract system. There are certain works of construction, however, that would be better done without a contract. Large engineering undertakings, such as bridges, which, if not properly performed at the outset, daily imperil the lives of thousands, would be best executed without a contractor. The Tay Bridge disaster is a warning in this way. But, unless it can be shown that sewering, paving, and the like can be more economically carried out by dispensing with the contractor, the County Council had better stick to old—or new—customs.

A contract has been sealed, between the Court of Common Council and Messrs. Arrol, Biggart, and Co., for the construction of the iron and steel works of the superstructure of the Tower Bridge. It is well that this firm should undertake the work, they having had the great experience that must have accrued from the construction of the Forth Bridge. In their article in the *Nineteenth Century*, the engineers, Sir John Fowler and Mr. Benjamin Baker, speak very highly of the assistance rendered, in the many difficulties encountered during the conruction of their bridge, by the readiness of Messrs. Arrol and Co.

Your correspondents Messrs. Longmire persist in their illogical style of writing touching the "Sheet of Contrasts" of St. Alban's Abbey. Their excuse for not detailing the "inaccuracies" of this drawing is certainly lame. Why not advance even one objection to the sketches? If they would bring forward in succession the various misrepresentations, we could meet them and confound, or be confounded, as the case might be. As things are at present, I do not feel at all in duty bound to put myself out of the way to get to St. Alban's: it would be a different matter if your correspondents set forth in black and white the exact misrepresentations contained in Mr. Steinmetz's drawing. Anyhow, it would not be a trouble, but a most interesting and pleasing visit for me to St. Alban's: it is only the time and opportunity that are necessary. And touching these averred truth-wrestling drawings, what says our friend "Ars"? His position is exactly that of Messrs. Longmire. Quoth he, in your last issue, "Mr. Steinmetz's sketches are notoriously (as I said) fancy sketches, wrong in detail and measurement." But why not state exactly in what particulars the drawings err? In which of the sketches is the exaggeration or misrepresentation most evidenced? There are the the drawings, and it would appear to be an easy matter to put down in black and white one's grievances. Neither Messrs. Longmire nor "Ars" have attempted to do so. They first excuse themselves in a somewhat involved manner, the gist of which, however, may be taken to be that they consider the readers of the "B. N." biased and prejudiced. Since, therefore, it is said that none are so blind as those who will not see, they give it up as a hopeless task. "Ars" makes the assertion given above, and then runs off on to subjects for the most part alien to the controversy. Why not come to an anchor for a moment on the question of the inaccuracies and misrepresentations?

The choir of Peterborough was reopened for service last week, and the Cathedral is now *plus* a certain amount of additional interest, in that during the progress of the works a cruciform Saxon church was discovered, or so much of it, or its site, that remained *perdu* for so many centuries. This interesting relic has been carefully preserved by the erection of a crypt to carry the floor of the south transept of the cathedral. The cost of the restorations has been great, a sum of £25,000 having, within the last six years, been expended on the works under Mr. Pearson, and a further sum of £25,000 or £30,000 is required to complete the restoration. That wonderful conception, the west front, is, I believe, next to be tackled.

Touching certain applications for an injunction to restrain some persons from obstructing the light of neighbouring buildings, Mr. Justice Kay recently declared that the evidence of architects and surveyors was much exaggerated on both sides, and that it was shocking how expert witnesses could be found who made statements on oath which they knew not to be true. This is a good square hit from the shoulder, and may have been deserved or not; few persons but those concerned can say whether the condemnation was merited. But, as a general rule, I am quite prepared to say that Mr. Justice Kay was speaking plainly upon a question of vital importance. Besides the direct evil of the unsettled state of the law with regard to questions of light and air, I have long thought it to be regretted that it should be productive of indirect evils. It is not at all creditable that it should be possible for a Judge to make an assertion such as that of Mr. Justice Kay. I am very thankful to say that I have had little to do with cases of light and air; but that does not preclude one from making observations, and marvelling at the state of things that will allow two men to prepare affidavits and swear against each other in cases where the real state of affairs must be only too evident to the impartial onlooker. I do not intend to make any apology for speaking on a subject which, excepting a few incidental hints, I have hitherto excluded from these pages; but Mr. Justice Kay's remarks cannot be allowed to be passed over unnoticed. They may not always apply, but in many instances they are clearly applicable; and it would be well for the profession that its members should recognise the fact.

Why is it so difficult to elicit comments on jerry building? Mr. Stanley G. Bird, I see, alludes to, and makes suggestions *re*, Mr. Arthur Lee's article on "An Evil System"; but why do not you receive a host of condemnatory letters? Everyone acknowledges the harmfulness of the leasehold system, both to the public, to architecture, and to the architectural profession; but it seems hopeless to expect an enthusiastic discussion on the topic. Yet here is a question that daily becomes more serious. Its effects are both evident upon the nation and the individual. Everywhere we turn we find rotten buildings, complaining tenants, fever-stricken inhabitants of shoddy houses, and sleek landowners and lawyers. Everyone knows what a jerry builder is; few have not experienced the discomforts, annoyances, and dangers of his vile productions. Under the system the architect only receives about one-tenth or less of payment for designs and superintendence of buildings. Yet why, I repeat, is it that many rush into print when an abbey is being destroyed, and remain silent whilst their business prospects are being undermined, and their professional calling deeply injured? I can only think of one explanation. Perchance it is because the leasehold system has silenced the tongues of thousands who dare not or cannot conscientiously complain whilst they derive a few miserable fees from struggling speculative builders. If this is indeed the reason, then all hope of help from within must be abandoned. Until the voice of the whole profession be heard in deep complaint, the architectural calling will continue to suffer from the "evil system." It will be useless to decry the shortcomings of the leasehold system whilst so many rely upon it for the few guineas that the survey of the abortions of the jerry-builder produce. GOTH.

CHIPS.

The West Riding County Council at their last meeting appointed the four following inspectors of main roads for the riding:—North-western district, Mr. Matthew Fenwick, of Wakefield, salary £250 per annum; north-eastern district, Mr. Thomas Clark, of Ripon, at £120; south-western district, Mr. John Farrer, of Oulton, at £165; and south-eastern district, Mr. Joseph Fearnley, of Featherstone, at £175.

The new church of St. Peter's, Scaitcliffe, Accrington, which the Bishop of Manchester consecrated on Wednesday afternoon, comprises nave and chancel, north and south aisles, organ chamber, and vestries. It will seat 700. The design, which is Gothic, is from the drawings of Mr. Henry Ross, of Accrington.

The alterations in the Police Chambers, Edinburgh, which have been in progress for the last few months, have now been completed. The building includes a new court room and charge office, with their waiting rooms for witnesses and connection with the cells. The plans were prepared by Mr. T. Morham, city superintendent of works. Mr. Colin Macandrew was the contractor.

The spire of the parish church of Wakerly, near Oakham, having been found to be unsafe, works of restoration have just been commenced. Mr. J. B. Corby, of Stamford, is the architect, and Mr. S. F. Halliday, of the same town, the contractor.

The proposals of the English engineer, Sir Charles A. Hartley, for enlarging the harbours of Bourgas and Varna have been accepted by the Bulgarian Government.

The Roman Catholic Church of St. Francis of Assisi at Ascot was consecrated last week by the Bishop of Portsmouth. The architect is the Rev. A. J. Scoles.

A new Congregational chapel and schools, erected in Victoria-road, Eccleshill, Sheffield, were opened on Wednesday week. The chapel and schools have been erected as a Jubilee celebration, and have entailed an outlay of £8,500. The buildings, which are in the Decorated Gothic style, have been erected from the designs of Messrs. T. H. and F. Healy, of Bradford. Accommodation is provided for about 850 persons. The principal entrance to the chapel is at the west end, the north-west staircase being carried up to form a turret 82ft. in height. The schools accommodate 700 scholars, and in a separate room there is an infant school for 100 children. The schools are built on the central-hall plan, there being a large central hall, surrounded by eighteen class-rooms of varying size. Local stone has been used throughout.

WATER SOFTENING.

By George E. Davis.

MANY steam users have at last commenced to discern that the steam boiler is not the proper place in which to deposit the mud and filth from the feed water employed in generating steam. To those of our readers who have discovered this fact for themselves no words or exhortations will be necessary, still there are many of the old school still existent, and who have yet to be won over to the new *régime*. The softening of water on the large scale presents itself to us as two problems—one mechanical, the other chemical—and it is only by a proper combination of the two that success can be insured. A water temporarily hard by reason of its containing carbonate of lime held in solution by carbonic acid requires a treatment differing from that of water permanently hard by sulphate of lime, to say nothing of other constituents present in the various waters employed in producing steam.

From "temporary" hard water the addition of lime water will cause the separation of the whole of the carbonate of lime held in solution by the carbonic acid, plus the carbonate of lime also formed by the union of this carbonic acid with the added lime. From permanently hard water, the addition of lime extracts nothing save the carbonic acid which all waters contain, and perhaps magnesia, if these salts are present; but the use of lime in every case requires the greatest care in manipulation, as it is easy to make the water worse than it was originally.

Many processes have been devised from time to time in order to make hard waters suitable for boiler feeding. Some of them have been a nine days' wonder, and on the 10th day the glory of their fame has vanished. Many are the nostrums now in use for "fetching off scale," the users not having yet learned the lesson that it is better to keep the scale-forming substances out of the boiler in the first instance. Steam users should, however, know that without the active agents are used in definite proportion, easily ascertained by a chemical analysis of the water, the use of anti-incrustating agents is nearly useless. Of all the substances used as preventives of scale, the tribasic phosphate of soda is, no doubt, the best; but it is dear, comparatively speaking, and its combining weight is high. Next to this comes caustic soda, which forms the basis of most "boiler compositions," and it would be well if steam users bought and used the pure and undiluted article themselves, as all the other added materials are of but little moment. We have already mentioned that the anti-incrustating agent must be applied to the feed water in due proportion, and this quantity is far beyond what most steam users imagine. A few pints of a weak solution daily is of no more use than an expectoration. There is a certain minimum which must be applied. On the other hand, there must not be too much caustic alkali in excess, as in such a case the tendency to priming will be increased; and further, the caustic alkali will act upon and destroy the brass fittings upon the boiler in a very short space of time. Carbonate of soda, either in the shape of soda ash or as soda crystals, has often been recommended to prevent incrustations in steam boilers, but it is not nearly so efficacious as caustic soda or tribasic phosphate of soda, as a simple experiment will prove.

The softening of a water that has occupied my attention lately may well serve as an illustration of the foregoing remarks. I was asked to soften five millions of gallons per week of 144 hours. The water gave the following results upon analysis:—

Grains per Gallon.	
Total solids	63·50
Loss on ignition	13·00
Chlorine	3·23
Hardness	36·00
Parts per Million.	
Ammonia	0·10
Albuminoid ammonia	0·06

A further investigation showed me that the hardening constituents existed in the following proportions in grains per gallon:—

Carbonate of lime (held in solution by carbonic acid)	5·20
Sulphate of lime	24·30
,, ,, magnesia	0·15
Magnesium chloride	4·27
,, nitrate	17·27

The foregoing quantities show to the trained mind the magnitude of the operations which have to be performed. Five million gallons of water contain not less than *six tons* of magnesium nitrate, or three hundred tons per annum. We will, however, look at it from another standpoint. The carbonic acid holding the carbonate of lime in solution does not merely exist in the proportion of $CO_2 : CaCO_3$, it is much in excess of this; in some well waters twice or thrice CO_2 to $CaCO_3$—in such cases the carbonate of lime does not commence to precipitate until all the free carbonic acid in the water has been neutralised by a caustic alkali or alkaline earth. With some waters lime is a very useful purifying agent; but in this instance there would be no advantage in its employment. A very interesting series of experiments can be made with the foregoing water. Take three separate portions of one gallon each. To the first (*a*) add 36 grains of pure carbonate of soda, previously dissolved in a little of the water; to the second (*b*) add 27 grains of high strength caustic soda* (Allhusen brand); and to the third (*c*) add 100 grains of tribasic phosphate of soda. If these additions be made in the cold, the different action of each will be remarkable; *a* may possibly become opalescent to a slight degree; but no appreciable deposit will occur even after twenty-four hours' settling. The portion *b* behaves very differently: first it turns opalescent, and then there slowly deposits a bulky precipitate, consisting of carbonate of lime, magnesia, and other impurities. The portion *c*, however, commences to precipitate the moment the phosphate is added, and in a very short time the deposit has settled to the bottom of the vessel in which it is contained, leaving, even with dirty water, the solution in the clearest possible condition.

We may now alter the physical conditions and observe the change. Place each vessel over a large Bunsen burner and heat to 70° C.; *a* throws down a small quantity of a sandy precipitate, *b* deposits a large quantity of a similar character, while *c* does not differ much from *b*. If we continue to heat the water, as the carbonic acid is expelled from *a* so we get a larger precipitate, but with *b* excessive boiling is not by any means necessary. We have thus arrived at several important conclusions: (1) Softening with carbonate of soda (soda ash) requires to be done at the boiling temperature, and, therefore, must be effected in the boiler. (2) Softening completely with caustic soda only requires the water undergoing treatment to be heated to 80° C.; this can be done in the boiler, and the insoluble matters easily filtered off in an apparatus such as that of the Pulsometer Engineering Co.

The water such as I have already given the analysis of would cost most probably about one halfpenny per thousand gallons for pumping. The softening would cost more. The quantity of high strength caustic required would be in grains per gallon:—

To decompose the sulphate of lime	14·4
,, ,, ,, magnesia	0·1
,, ,, magnesium chloride	3·6
,, ,, ,, nitrate	9·4
	27·5

But some may say sulphate of lime is not decomposed by caustic soda—this is quite true—but the moiety of the caustic soda immediately becomes carbonate by combination with the excess of carbonic acid in the water, so that caustic soda may be said to be doubly effective—first it absorbs the carbonic acid, allowing the actual carbonate of lime to fall; and secondly, the carbonate of soda so formed acts upon the sulphate of lime, producing carbonate of lime and sulphate of soda.

Caustic soda added to a boiler feed-water will eliminate the lime salts, but I have not found it so easy to throw down the magnesia. Where a water contains much magnesia, I prefer a suitable mixture of caustic soda, carbonate of soda, and tribasic phosphate of soda, the quantities of which must be calculated from the results of the analysis of the water. To illustrate by an exact experiment, the water of which an analysis has already been given was treated with a mixture of—

Caustic soda (77 per cent.)	17 grains
Carbonate of soda	17 ,,
Tribasic phosphate of soda	5 ,,

The water contained in grains per gallon—

	Before treatment.		After treatment.
Lime	12·9	..	0·78
Magnesia	6·6	..	3·78

having deposited 28·3 grains of a precipitate consisting of—

	Per cent.
Lime	42·10
Magnesia	11·07
Carbonic acid	33·24
Peroxide of iron	4·00
Alumina	6·20
Phosphoric acid	3·45

On such a quantity as five million gallons per week 28 grains of dry solid matter per gallon would amount to no less than *nine tons*, or about 25 tons of semi-dry sludge. The quantity of high strength caustic soda required would be about nine tons weekly, so that the cost of purifying such a water as this would average 3½d. per thousand gallons. This of course is an exceptionally bad water to purify, but I hope I have sufficiently indicated that purification may be effected at a price, and also what that price is. Nearly every water can be successfully treated in one way or another, the exact process is a question for the chemical engineer. One word to the steam user: Do not use any of the secret nostrums, and do not endeavour to "fetch off scale," but rather devote your energies to its prevention; when scale is formed the mischief is done, it is too late then to apply the remedy.—*Chemical Trade Journal.*

* The Newcastle Chemical Works Co. are now grinding this caustic and packing it in hermetically sealed tins of moderate size.

COMPETITIONS.

Cork.—Holy Trinity Church, Cork, which is referred to in Thackeray's "Irish Sketch-Book":—"On the road is a handsome Roman Catholic Chapel, or a chapel which will be handsome so soon as the necessary funds are raised to complete it. But, as at Waterford, the chapel has been commenced, and the money has failed, and the fine portico which is to decorate it one day, as yet only exists on the architect's paper." The new façade scheme has just been the subject for a competition, and Mr. G. H. Ashlin, R.H.A., acted as professional referee. About three months ago the Father Mathew Centenary Committee issued a circular to some of the leading architects practising in Ireland, about twelve in number, all more or less identified with ecclesiastical architecture, inviting them to send in designs for the façade of this church, which it is now proposed to complete as a memorial to the famous apostle of temperance—a well-designed tribute to the memory of the man who spent the funds it had taken him years to collect for the erection of his church on the starving poor of Ireland during the year of the great famine. From the twelve designs—the identity of the authors being distinguished by a motto or *nom de plume*—submitted, three were selected for further competition, the authors being required to furnish all the work, drawings, and other requirements necessary for the perfection of the building contract, for which each was rewarded with the *honorarium* of £50, the author of the design finally selected by the committee being chosen as the architect of the work. The successful competitor is Mr. Walter G. Doolin, M.A., of Dublin, who is already known as the architect of the churches of Lismore and Killorglin. The conception of the Messrs. Payne, the architects who more than fifty years ago began this church, is in its way a noble one and thoroughly original. There is certainly no precise similarity between the two designs. In style the present design is English Gothic of a Late Perpendicular type. The façade consists of a portico of three arches the full height of the nave, with screens of sculptured stonework at the base, having niches containing the patron saints of the southern provinces. The general treatment reminds one of the transept of Peterborough Cathedral, save that the centre arch is much wider than the side arches. Over the main gable rises the tower, which rests on the piers of the centre porch. It is in three stages, reducing in width as it ascends, and the angles of each stage are marked with pinnacles and flying buttresses. Indeed, the novel feature of the design is the treatment of the angles, which are of peculiar strength. The spire is octagonal, and is also supported by flying buttresses, and pinnacles at the angles, the four cardinal faces being lighted by lofty Lucerne windows, which project very boldly. A cross of wrought iron crowns the whole, and reaches a height of 163ft. All the work is to be done in County Cork limestone. The estimated cost of erection is £6,000. The time necessary for the completion of the work is eight or nine months; and it is anticipated that the building will be commenced about the end of September. Eleven other architects sent in as many designs to the committee of selection, all most carefully and artistically executed, and of these the designs of Mr. Coakley and Mr. A. Hill were awarded £50 each for excellence in conception and in treatment.

Alterations have been made to the Bethnal House Asylum, Bethnal Green, London, embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

Langton-street Wesleyan Chapel, Bristol, has recently undergone complete renovation, the work being carried out under the superintendence of Messrs. Foster and Wood, architects.

The New Wilts and Dorset Bank, Torquay, is warmed and ventilated by means of Shorland's patent Manchester stoves, supplied by Mr. E. H. Shorland, of Manchester.

Building Intelligence.

Blyth.—A few days ago the new banking remises, which for some time past have been in ourse of construction for Messrs. Woods and o., at Blyth, were opened. The structure, hich occupies a very prominent position, is tuated at the corner of Stanley-street and ridge-street, and is built of red brick with one dressings, and terracotta ornamental panels. he elevation is in the Queen Anne style. The anking-room is on the ground floor, is amply entilated, and suitable warming facilities are fforded by a large firegrate and a heating stove. o the left-hand of the bank is situated the anager's private office, off which is the strong oom. In direct communication with the bank s a residence for the manager, with an entrance rom Stanley-street. The building has been erected rom the plans and under the supervision of Mr. . J. Lish, architect, of Newcastle-on-Tyne, and Messrs. N. and R. Reed, Newcastle, are the contractors.

Crediton.—The fine Perpendicular public hurch was reopened last week after restoration arried over a number of years, and executed rom the designs of Messrs. Hayward and Son, Exeter. It began with the restoration of the Lady-chapel, which had fallen into total disuse. The walls were cleaned and repointed, the stonework repaired, and floors laid with tiles, and the chapel ceiled with an oak roof. The governors next took in hand the roofs, which were of deal and plaster; they are now replaced by a ceiling of oak, framed and moulded in the Perpendicular style. The pillars are finished off with carved bosses. These roofs were constructed by Mr. W. Dart, of Crediton, who has also been the contractor for all the other woodwork, Mr. Berry doing the masonry. The extremely large roof of the nave also had a plastered ceiling, and has been swept away and replaced by a roof in the Perpendicular style, with framed and moulded principals carried on carved ribs, the spandrels being filled with open tracery. The purlings and other main timbers are moulded, and finished off by carved bosses. The nave contains a clerestory, which is an uncommon feature in Devonshire churches. The unsightly western gallery was pulled down, and the great west window has been filled in with painted glass at a cost of £500. The north and south transept roofs have been renovated, which have now framed principals supported by curved ribs resting on carved corbels. The side galleries in the north and south transepts were taken down, and the work of repairing the tower was next commenced. The tower was ceiled with oak beams and moulded timbers and bosses. This completed the task of reroofing the fabric, in which many thousand feet of oak were used. Under the same contractors and architect, the work of reseating the nave from the designs of Messrs. Hayward was next put in hand and completed. The seating is of oak, with moulded bench-ends filled with tracery and carvings. Under the seats is a wood-block floor laid in herringbone patterns. The floor of the nave has been lowered, so as to expose the Late Norman work which was discovered upon the tower piers. The bases of the nave arcade have been restored, and the mutilated stonework carefully made good. The south porch, which contains the remains of the library of the old Collegiate Church, has been altered to suit the new level of the nave. The new pulpit is of yellow Mansfield stone upon an octagonal base, the work having been carried out by Mr. Trevenen, of Plymouth. The side aisles of the nave are reseated, and the aisles floored throughout with Godwin's tiles, the side aisles of the church being paved with oak blocks. The floors and steps to the altar have been laid with marble, and Messrs. Paterson and Son, Manchester, have floored the chancel with marble mosaic. The work has cost between £3,000 and £4,000.

Edinburgh.—Additions to, and alterations on, the City Chambers are about to be made for providing for the increased requirements of several departments of the city. The addition is obtained by taking in the whole of the property in the north-east corner of the Royal Exchange, including the stair there. On a level with the piazza the Water Trust public office will find a new home in a room about 40ft. long, 20ft. broad, and 20ft. high. A portion of the present premises of that Trust will be converted into rooms for officials, but the treasurer's department will become a large room for committees. On the floor above will be another new committee-room. This room will be treated with oak panelling, while the ceiling will be coved and deeply moulded, with curved ribs, &c. Above it will be located the library, having a circular coved ceiling, in which lunettes will be formed for light. The cells under the Burgh Court are to be reconstructed with a view to their better lighting and ventilation. In the Burgh Court itself more space is to be secured, and the town clerk's office is to become larger, measuring 48ft. by 28ft. One block is to be made entirely fireproof, and form principally a series of safes for the use of the various departments. They will all have groined-brick roofs, and that of the town clerk is to have a 20ft. high gallery running round it. Heating and ventilating apparatus for the whole building will be placed at the bottom of this block. The system of drainage, too, is to be overhauled. The work is estimated to cost about £4,000. Mr. T. Morham, City Superintendent of Works, prepared the plans.—The Edinburgh School Board are about to make an addition to their numerous educational establishments. Plans for the new school have been prepared by Mr. Robert Wilson, architect, and were approved by the Board this week. The style is Queen Anne. The extreme length is about 140ft., and the width is some 40ft. less. All the main teaching class-rooms and staff-rooms are on the ground and the first floors. On the second floor, which does not cover the entire area of the building, there are demonstration cookery room, practical cookery class-room, science room, drawing class-room, and store and spare rooms. In order to utilise the slope of the ground a basement floor is provided under part of the school. Here there are a swimming-bath 50ft. by 18ft., and a gymnasium, including the platform at the end, 52ft. by 26ft. The building will accommodate nearly 1,500 pupils. The building, which is to be called Sciennes Public School, will probably cost about £18,000.

Leeds.—The foundation-stone of a branch school in connection with the Leeds Friends' Adult School was laid last week. The building will be erected from plans by Mr. Wm. H. Thorp, of Leeds. It is chiefly one-storied, and covers an area of about 800 square yards. A spacious open porch, carried up as a tower, conducts to a vestibule, with staircase, hall, and cloak-room adjoining, and opening from it is the central meeting hall, round which the other departments of the building are grouped. The meeting hall is 60ft. in length and 33ft. in width. The roof is of open timber construction, the height from the floor to the wall-plate being 25ft. It will be lighted above the surrounding class-rooms by ranges of windows on three sides. The accommodation provided will be for from 400 to 500 persons, and an additional 100 can be seated in the gallery. On the south side of the hall is a suite of five class-rooms, varying in size from 24ft. by 13ft. to 13ft. by 9ft. 6in., and on the east side is the library. On the north side is a meeting-room 37ft. by 23ft., and three class-rooms. The total cost will be about £3,000, exclusive of land. The building will be faced with pressed bricks, with Guiseley stone dressings, and the roof will be covered with Bangor slates. The style of architecture adopted is Flemish-Gothic of a secular type. All the contracts will be carried out by local firms.

Manchester.—The new offices which have been built for the use of the Manchester School Board are now nearly completed. The scheme for the new buildings was approved about the end of 1887, and seven architectural firms in Manchester were invited to send in designs. Mr. Thomas Worthington was called in by the School Board to report upon the drawings, and he selected as the best those prepared by Messrs. Royle and Bennett, of Cooper-street, which were adopted. The site of the offices is in Deansgate, a piece of land extending to 400 square yards. The offices, to the string over the ground-floor windows, are of red Runcorn stone, the upper portion being of terracotta with red stone dressings. There is some effective ornamentation of the exterior in terracotta. The principal entrance in Deansgate opens into a spacious hall, well lighted. Upon the right-hand side, on the ground floor, are the general clerks' offices, and an ante-room giving access to the office of the clerk of the Board and the cashier. Upon the left-hand side are the offices of the inspector of schools and his assistants, a small committee-room, and a waiting-room for parents having business with the officials of the Board. A handsome staircase leads to the second floor, the larger part of which is occupied by the board-room. This is a fine apartment, 38½ft. by 22ft. The upper sashes of the windows—and this feature characterises nearly the whole of the offices—are filled with stained glass. The room is lofty, with a very handsomely designed ceiling, and the walls are wainscoted in oak. Adjoining the board-room is a committee-room, 23ft. by 22ft., with two smaller rooms for the use of members of the Board, lavatories, &c. The third floor contains a large apartment providing accommodation for about 30 school attendance officers, with a private office for the superintendent. There is also an office for the industrial school attendance officer, a dining-room for the use of clerks and officers, and a kitchen. Above this, again, is a room to be used for the storage of papers and documents. The cost of the site is £8,000, and of the building about £12,000. Messrs. R. Neill and Sons are the builders.

Monton Memorial Schools, Manchester.—The new school buildings here were opened on Saturday. They contain, on the ground floor, the large schoolroom, 42ft. long, 32ft. wide, with two classrooms at each end; the infant school, 32ft. by 22ft., with classroom adjoining; lavatories and cloakrooms for boys, girls, and infants; kitchen, with basement kitchen under, communicating with staircase and lift; and porch and staircase for public use. The large hall, 64ft. by 32ft., is placed on the first floor, and is a lofty room, with sloping ceiling, showing the hammer-beam principals of the roof, with a raised platform at one end, opening into the hall by a wide archway, fitted with special provisions for being readily converted into a stage for dramatic performances. The building is substantially constructed, the outer walls being built with a lining of brickwork, and cavity for warmth and protection against damp, and faced with stone throughout to correspond with the church; the roofs are covered with green Westmoreland slates, and the principal rooms have pitch-pine dadoes round the inside walls. Messrs. Wm. Southern and Sons, of Salford, have erected the buildings, under the direction of the architects, Messrs. Thos. Worthington and J. G. Elgood, of 46, Brown-street, Manchester. Mr. W. Wilson has acted as clerk of works throughout.

Newcastle-on-Tyne.—The foundation-stone of a new Presbyterian Church of England for the Arthur Hill district of Newcastle was laid on Monday. The church consists of a nave 76ft. by 28ft. and 41ft. high, aisles 14ft. wide. Tower 18ft. square externally and 60ft. high, surmounted by a conical roof 30ft. high. Two vestries are provided, 20ft. by 13ft. and 13ft. by 12ft. respectively, each being in connection with church and schools. The schools only are at present being built. The accommodation of the church when completed will be 840, and that of schools 460. The contractors for schools are Messrs. T. and R. Lamb, Grahamsley-street, Gateshead. The whole has been designed by Mr. William Lister Newcombe, F.R.I.B.A., 89, Pilgrim-street, Newcastle-on-Tyne.

Peterborough.—The choir of the Cathedral, which has been closed for restoration for six years, was re-opened on the 11th inst., having been temporarily fitted up so that service might be held in it. There is in the choir no screen at present, a wooden partition separating it from the nave, while the Bishop's throne and canons' stalls have also to be supplied. The temporary choir extends under the central tower and westward past two of the bays of the nave, while the organ has been placed at the end of the north aisle of the nave, the congregation being seated in the transepts. When the permanent fittings of the choir have been provided, it is proposed to place a stone screen across the end of the nave, instead of at the opening of the choir. On the erection of the stone screen the organ is to be placed in the triforia, with the key-board on the screen. Some £25,000 has been spent on the work of restoration, the lantern tower having been rebuilt, the north and south transepts underpinned, and three columns in the choir having been repaired. The work has been carried out under the direction of Mr. J. L. Pearson, R.A. One of the most interesting discoveries during the restoration was the site of the cruciform Saxon Church under the south transept, and over which a crypt has been built.

To complete the restoration £25,000 to £30,000 is still needed, for the screen and 26 canons' stalls have yet to be provided. Lady Elizabeth Villiers will defray the cost of eight more stalls, having promised £1,250 for the purpose, and two others have been given. The nave has also to be cleaned and the repair of the west front undertaken. Mr. John Thompson, of Peterborough, has been the contractor.

ST. LEONARD'S-ON-SEA.—The R.C. Church of St. Thomas and the English Martyrs has been rebuilt on the old site, in blue ragstone, with windows and dressings of Bath stone, and the internal walls of brick. The style is the Early English lancet. The plan comprises a nave 84ft. in length, and 40ft. wide, with north and south chapels, six on each side, 11ft. 7in. between the internal buttresses, by 7ft. 6in., the clear width of this part of the building being 55ft. The apsidal chancel is 25ft. in length, flanked by two lateral chapels. A sacristy in the north connects the church and presbytery. The interior length of nave and chancel is 109ft. The interior of the arched and boarded roof of the nave has transverse and moulded diagonal moulded ribs rising from stone shafts attached to the piers formed by the buttresses, with bases, bands, and moulded capitals, as in the old Dominican church at Ghent, now destroyed. The chancel arch, 30ft. in height from floor to springer, is supported on clustered shafts with foliated capitals, bosses, and brackets, carved by R. C. Boulton, of Cheltenham. The floor throughout is of wood block paving with oak steps. The high altar, the gift of Mr. and Mrs. Boulton, is supported on marble shafts, between which appear three cusped panels and groups of sculptured figures. The architect is Mr. Charles Albert Buckler, of Hereford-square, South Kensington, and Mr. E. Boniface, of St. Leonard's, was builder.

ST. OSWIN'S PARSONAGE.—The village of Wylam, in Northumberland, has just had an addition to its church premises by the erection of a parsonage. The building is in the Tudor style, to harmonise with the church, and provides ample accommodation for the resident clergyman. The work has been carried out from the designs and under the supervision of Mr. J. J. Lish, architect, Newcastle-on-Tyne, and Mr. John Hunter, Houghton-hill Head, was the contractor.

SELKIRK, N.B.—The foundation-stone of a new church for the West U.P. congregation of Selkirk was laid on Saturday week. The new church occupies a commanding site near the Free Library and County Buildings, and is designed in Gothic of Scottish Decorated period, so as to harmonise with these buildings. A massive square bell tower, which will rise to about 100ft. above the roadway, will form a principal feature, and it is proposed to place a peal of bells in the tower. The church will seat about 700 persons, besides the organ gallery and choir, and there are also in connection halls for 300 and 100 respectively, besides committee-rooms, vestry, &c. The contractors are entirely local, and the work is from the designs of Mr. John B. Wilson, A.R.I.B.A., Glasgow. The total cost is expected to be about £4,500.

SUNDERLAND.—The memorial stone of a new Congregational Church was laid at Sunderland on Tuesday. The church will have accommodation for about 800 persons. Its tower will rise to a height of 85ft. Internally the nave will be divided from the aisles by three arches on either side, each of 18ft. span, carried on polished granite shafts with moulded capitals and bases of stone. A moulded arch will separate it from the choir. Above the nave will be clerestory windows of seven lights each. The cost of the building when completely finished will be about £5,000. Mr. T. P. Shaftoe, Holmside, Sunderland, is the sole contractor, the architect being Mr. W. Lister Newcombe, F.R.I.B.A., of 89, Pilgrim-street, Newcastle.

The memorial-stones of a new Wesleyan Chapel, situated in the Sandon-road, Edgbaston, were laid on Monday. The chapel will accommodate between 700 and 800 persons, and the interior and exterior will be of red brick and stone in nearly equal proportions. The nave will be 81ft. by 30ft., in five bays, one bay being screened off for a chancel, in which the organ, in two parts—one on either side of the altar—is to be placed. The height of the nave to the eaves will be 28ft., and its covering will consist of a handsome boarded barrel-vaulted roof. The architects are Messrs. J. L. Ball and E. Barnsley, and the builder is Mr. Moffat.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

ARCHÆOLOGICAL CONFERENCE.—On Wednesday afternoon a conference of the delegates of the leading county archæological societies was held at the rooms of the Society of Antiquaries at Burlington House. Mr. John Evans, D.C.L., President of the Society of Antiquaries, was in the chair. The first subject for discussion was the formation of county archæological maps on the plan already accomplished by Mr. Payne for Kent, and the following resolution, proposed by by the Rev. Dr. Cox, and seconded by Mr. Ralph Neville, was unanimously carried:—"That each local society be requested to take into consideration the desirability of placing on record on the large ordnance maps of the county with which they are concerned, all the local names of fields and all relics of antiquity for which a locality can be fixed; and that such maps should be kept in duplicate, so that eventually a copy may be deposited with the Society of Antiquaries." The question of the preservation of ancient monuments and buildings was next discussed. General Pitt-Rivers, Inspector of Ancient Monuments, gave an interesting account of the working of the Act under which he was appointed. Eventually Mr. J. T. Micklethwaite proposed, and Mr. Leveson-Gower seconded, the following resolution:—"That all local societies be requested to be on the watch against any wilful or injudicious destruction of ancient monuments or buildings, so as at once to bring local opinion to bear against the destroyers; and that in cases of what appears to be national importance, the aid of the Society of Antiquaries or of the Inspector of Ancient Monuments be invoked." A third subject brought before the conference was the publication of parish registers, introduced by Mr. Ralph Neville, about which there was much talk and some little difference of opinion. The result was the nomination of a small committee to deal with the subject and to report to the different societies in union. The Rev. Dr. Cox brought forward the subject of provincial records, and spoke in favour of the proposal to make county councils responsible for their due preservation. After much discussion the general opinion seemed to be that the delegates could not pledge themselves to the support of any definite scheme or Bill at the present conference; but it was moved by Dr. Cox, and seconded by Mr. W. G. Hardy, and unanimously carried:—"That the attention of the local societies in union be called to the proposed Bill entitled an Act for the Preservation of Public and Private Records, which it appears may provide for a long-recognised want." The next conference was fixed for July, 1890.

BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.—This year's summer meeting of the Bristol and Gloucestershire Archæological Society is being held at Cheltenham, and the proceedings were commenced on Tuesday morning, when a somewhat desultory address was delivered by the new President, Mr. Agg-Gardner. The members then retired for luncheon, and at two o'clock there was an excursion to Swindon, a village about three miles distant from Cheltenham; to Stoke Orchard, to Tredington, and Boddington Manor. At a quarter past seven the annual dinner took place at the Plough Hotel, and a meeting for the reading and discussion of papers followed.

CAMBRIAN ARCHÆOLOGICAL ASSOCIATION.—The forty-fourth annual meeting will be held in Brittany during the fortnight commencing August 12th, 1889. Excursions will be made from Auray and Morlaix. On Monday, 12th, members will leave Southampton in the evening by the London and South Western Railway Co.'s steamer direct for St. Malo. On arrival at St. Malo on Tuesday morning members will take the train for Redon (*viâ* Dol and Rennes), and sleep there the night. On Wednesday, 14th, members will proceed by train in the morning to Vannes, stopping there to inspect the museum and cathedral, and then go on to Auray in the evening, where the party will remain for the next five nights. On Thursday, 15th, by carriage to Lomarec, stopping to see inscribed sarcophagus, and then through Crach to Locmariater, to inspect megalithic remains, including the sculptured dolmen of Dol or Marchand, the great fallen menhir, the chambered cairn of Mané-Lud and that of Mané-er-H'roëk, &c. Afterwards the party will be taken by boat to visit the celebrated sculptured gallery and chamber in the tumulus on Ga Inis. On Friday, 16th, by carriage, throug Plouharnel, to Carnac, to see the alignments standing stones, Mr. Miln's museum, the Roma villa at Bocenno, the chambered tumulus Mont St. Michael, with its chapel and cross, ar several sculptured and cup-marked dolmens. C Saturday, 17th, by carriage, through Belz, to s Church of St. Cado, containing paintings illus trating the life of the Patron Saint, and situate on an island connected with the mainland by Roman causeway, 300ft. long. Thence to th inscribed pillar-stones at Locoal-Mendon an Caer Bili, near Landivant, and the early crosse stone at the Chapelle de Legeven in the sam neighbourhood. On Monday, 19th, railwa journey, *viâ* Quimper and Landerneau, to Morlaix where the party remain for the rest of the time Non-members wishing to take part in the meet ing must be introduced by a member, and will b required to pay the annual subscription of £1 1s. for which they will receive the *Journal* for th year, including number containing the report All communications to be addressed to Mr. J. R Allen, 20, Bloomsbury-square, W.C.

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE AND ART.—At a meeting of this institute, held on July 8th, 1889, the subject of the Architects Registration Bill was under discussion, and a recommendation of the council of that body to the effect that the Royal Institute of British Architects be petitioned to support the measure was brought up for consideration. It was resolved that the Institute petition the Royal Institute of British Architects to accord their support to the Architects' Registration Bill now before Partiament, and the President and Secretary were instructed to communicate the resolution of the meeting to the Royal Institute.

VISIT OF THE YORK ARCHITECTURAL ASSOCIATION TO SCARBOROUGH.—On Saturday the first summer excursion of the members of this Association took place, when a visit was paid to Scarborough. They were met at the station by Mr. Hall (Messrs. Hall and Tugwell), who first conducted the party to the new board schools, which are now being erected from their designs, which were chosen in competition. The schools when completed will accommodate about 1,400 scholars, but at present only two divisions out of three are being erected, which will be infants and mixed; the cost, exclusive of furniture for the two divisions, being about £10,000, or approximately £10 per scholar. The next place visited was the central board school, which has been built some years and is planned on earlier principles, having long school-rooms, with class-rooms at each end. The party was then conducted by Mr. Wellburn, one of the churchwardens of St. Mary's Church, to view the recent improvements on the north side of town, and from thence to the Old Church. The party having had tea with Mr. Wellburn at that gentleman's residence, visited other places of architectural interest, and returned to York by the late train.

CHIPS.

The new town-hall at Dewsbury, erected from the designs of Mr. Holton, of that town, is to be opened by the Marquis of Ripon on the 17th of September. The local Chamber of Commerce have resolved to accept the tender of Mr. Wm. Pate, of Leeds, for a painted window for the building, as the gift of the Chamber. It is to bear a figure typifying Commerce, and has been designed by Mr. Lawrence Scott, painter, of Dewsbury.

The interior of the Catholic Church of St. Mary's, Buttermarket-street, Warrington, has just been redecorated and embellished by the erection of a new Lady-altar, which has been placed on the left side of the altar. It has been designed by Mr. Pugin, of London, and sculptured by Mr. R. L. Boulton, of Cheltenham, at a cost of £160. A rosary window in stained glass is shortly to be added.

New board schools are being built in Ashley-street, Carlisle. Mr. T. Taylor Scott, of that city, is the architect, and Mr. J. T. Boothman, of Nottingham, the clerk of works.

The following gentlemen have received prizes at the examination held after Mr. H. Lovegrove's last series of lectures at the Architectural Association:—First prize, Mr. C. H. Strange; second prize, Mr. John Murray; third prize, divided between Mr. Wyles and T. Jenner.

Clissold Park, Stoke Newington, is to be formally opened to the public on Wednesday next, the 24th inst., by Lord Rosebery, as Chairman of the London County Council.

Engineering Notes.

New Railway from Wrexham to Brymbo.—On Saturday last Colonel Rich, Government Inspector, surveyed the new branch line of the Wrexham and Connah's Quay Railway Company from Wrexham to Brymbo. Mr. J. Wooley is the contractor. The line is about five miles in length, and runs from the central station, Wrexham, to the Lodge, Brymbo. The first station on the line is the Moss and Pentre, which is near to Gatwen Colliery. This station will meet the requirements of the very dense population of Pentre Broughton, Moss, and Cerney. There is also another station at Plaspower, in addition to the one at Brymbo. The line will be opened for traffic in a few days.

Southport.—Southport pier, which was half-wrecked by storm in February last, is to be rebuilt and enlarged. The whole of the damaged portion has been cleared away and rebuilt, special attention being paid to the firm sinking of the piles. The pavilion, the greater portion of which has yet to be erected, is being built on the other side, and will seat 500 people, with standing accommodation for 200 more. It will be 62ft. long, 40ft. wide, and 32ft. high, and is being built of wood and iron—the roof of the latter material—and partially covered with zinc. The inside will be panelled and finished artistically. In addition to that already detailed, the company have erected a ladies' room at the end of the present refreshment-room, while one or two small shops will also be built. The architects for the new pavilion are Messrs. Mellor and Sutton, and Mr. H. A. Matear.

The Tower Bridge.—The Court of Common Council at their last meeting sealed contracts with Messrs. Arrol, Biggart, and Co. for the construction of the iron and steel works of the superstructure of the Tower Bridge for £337,113, and with Mr. H. H. Bartlett for the masonry, brickwork, and carpentry for £149,122. The chairman of the Bridge-house Estates Committee said the estimate for the iron and steel work was originally £250,000; but, owing to the magnitude of the works, there was difficulty in making an exact estimate, and the contract was £20,000 less than when first sent in. No fewer than 15,000 tons of steel would be used. The contractors were the constructors of the new Forth Bridge. He believed the bridge would cost £60,000 or £70,000 above the original estimate.

CHIPS.

The Clerkenwell Vestry having by resolution urged the President and Council of the Royal Academy to open the Academy Exhibition on Saturday evenings at a reduced rate for the convenience and advantage of working men, were informed in reply that their request could not be acceded to owing to "practical difficulties" which stood in the way. Then the vestry asked the Academy authorities to receive a deputation on the subject. The latter declined to do so on the ground that their decision "was unanimously arrived at after very careful deliberation."

The French painter, Jules Etex, is dead. He was in his seventy-ninth year, and was the brother of Antoine Etex, the sculptor, who died last year.

The mission hall, Quorn-street, Edge-lane, in connection with St. Cyprian's, Edge-hill, Liverpool, which was noticed in our issue of the 12th inst., will have the floors laid with Lowe's patent pitch-pine wood block flooring. The same has also been used at the Hollingworth Bros. memorial wing, West Kent Hospital, Maidstone; the New Reform Club, Stockport; and the Library and Museum Buildings, Trinity College, Dublin.

The ceiling of Christ Church, Kilndown, Kent, painted in oil, and covered with various emblems by the late Right Hon. A. J. B. Beresford-Hope, is condemned as unsound and unsafe. Subscriptions are being collected for its repair, and for the introduction of more light into the church.

The memorial-stone of a new day and Sunday-school, now being added to St. Peter's Church, Bramley, near Leeds, was laid last week. The new school is being erected as an adjunct to the existing church schools, which have provision for 660 children. The plans have been prepared by Messrs. Paterson and Cowgill, of Bradford, who have made arrangements for the accommodation of an additional 298 children. The new premises are to be divided into one large central school and two class-rooms. The contracts accepted for the building and furnishing of the schools, and including cost of site, amount to £1,600.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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W. Walkerdine. (Inquire of Batsford, 52, High Holborn, W.C.)

Received.—J. A. and Son.—B. of W.—J. W., jun.—G. and Co., Limited.—W. and Co.—W. C. and Son.—W. S.—E. L. and Son.—B. S. and R.

"BUILDING NEWS" DESIGNING CLUB.

Jenny Peshong. (You have joined very late for this season. Look out for the new subjects in October; the last has been given for 1888-9.)—Willing to Work. (Ditto).—Horse Shoe. (We have not received a design marked with this motto for the Cocoa-house).

Correspondence.

ST. ALBAN'S ABBEY.

To the Editor of the Building News.

Sir,—I rejoice that my previous letter touched Messrs. Longmire and Co. "under the harness." Of course, they know all about St. Alban's, and a rare good paying job too. No one denies that, but why on earth do not Messrs. Longmire, in their very disinterested support of Lord Grimthorpe, make good their charge as to the alleged inaccuracies of the "Sheet of Contrasts" which you published? They do nothing of the kind, simply because they know they cannot. I dare say in one or two minor points faults may be found; but I happen to be acquainted with the church very well, and have seen repeatedly what dire destruction Lord Grimthorpe has wrought there, and I unhesitatingly say that these "contrasts" of yours are in the main "the truth, the whole truth, and nothing but the truth." As for your Cork correspondent "Ars," I entirely differ from him concerning the clerestory windows now in course of being demolished, and by reference to the drawings in Neale's "St. Alban's," where a carefully-measured detail of them is given to a large scale, anyone can see how "Ars" misstates the case. One of the windows had been, I know, at some time or other repaired with Roman cement ("Ars" calls it "brown clay"); but that is no reason why all the series round the retro-choir should be ruined and cleared out to make room for more of Lord Grimthorpe's atrocious abominations of architectural artifices. St. Alban's Abbey belongs to the Church of England, and not to Lord Grimthorpe—hang his money! The £60,000 has now become £80,000. "Ars" reminds one of Falstaff's "two men in buckram."—I am, &c., F.R.I.B.A.

Sir,—I thought I should not have had to trouble you again about "Ars's" misstatements. But really his logic is as strange as the good manners on which he prides himself. In the same breath that he implies the direction of the works at Winchester to have been taken out of Mr. Scdding's hands, he taunts your correspondents with having denied that that gentleman was responsible for the ugly marble cross. He calmly denies that they have seen the statues at Cork or Salisbury, without a shadow of ground for his remark. His arguments are mere contradictions, based on no facts whatever. Those who wish to rescue the fine old church from further destruction ask for nothing more than a visit to the ruins by unprejudiced persons. In conclusion, I defy anybody to point out a single important inaccuracy in Mr. Steinmetz's drawings. Mr. Longmire has certainly not done so, and "Ars's" criticisms as to inaccuracies of scale seem rather out of place when applied to small sketch elevations. Perhaps he or some other admirer could supply more accurate drawings of the new work, which, I am sure, would form an equally instructive contrast with similar illustrations of the older building. If anyone doubts this, let him compare the "contrasts" with Neale's drawings on the one hand and the actual productions of Lord Grimthorpe on the other.—I am, &c.,

A Hertfordshire Layman.

Sir,—Your correspondent, "A.S.S." (*sic*) asserts that "Ars" has fought an almost single-handed battle in defence of the above restoration. No wonder that, in a professional journal, few but professionals should have the courage to air their convictions. No wonder either that in this case the professionals should be ranged on the opposite side.

But, for all that, there are, at the present day, plenty of people, outside every profession, who are perfectly competent to form an opinion upon many matters which were formerly held to lie strictly within the province of that profession; and we are accustomed to hear criticisms passed with the utmost freedom by physicians upon the law, by lawyers upon the medicine, by artists upon the poetry, by poets upon the paintings, by clergymen upon the architecture, by architects upon the theology—of the professionals in those departments. I will make no apology, therefore, for taking up the sort of challenge which has been thrown out by several of your correspondents.

Let me premise, then, that I am one of those numerous clergymen who have made ecclesiastical architecture, at home and abroad, a study for many years; that I have many links of deep interest connecting me with St. Alban's Cathedral; and, having read the correspondence in your columns, I am of opinion that although "Ars" has been so often contradicted he has succeeded in setting up his main assertions so firmly again, that the allegations of the last writer about his letters are as absurd as they are untrue.

Having watched the attacks made upon Lord Grimthorpe pretty carefully, I find that the usual pretext for them is to be found in the difference between his mode of treating dilapidated buildings and the theory at present in fashion. The common theory, roughly stated, is that "historical continuity" requires the "restorer" to replace an exact copy of all pre-Reformation work which has become decayed. Lord Grimthorpe's view is that when the work is incongruous and poor in its conception, as well as rotten, it is pushing the "historical" argument to an absurdity to copy it in new material without even the merit of antiquity to atone for its badness; and that the purposes of history and archæology are amply served by the preservation of drawings and descriptions of what it had become necessary to remove. To me, and to many others, this appears to be simply common-sense. But, even allowing that, as in most sublunary matters, there may be something to be said on both sides, it is ridiculous to imagine that the restorer is not to be allowed to choose between the two methods.

Unsurpassed as St. Alban's Abbey is in interest among the great churches of this country, it is

the one, above all others, which supplies a refutation to the popular notion that all old work was good work. The chronicler tells us how the ambitious west front of John de Cellâ fell down before it was finished. When Lord Grimthorpe took its successor in hand, its fall was imminent. If it had taken place, one bay after another would have followed like a set of nine-pins, till the grand central tower had collapsed on the top of the heap. When the angle turrets of the transepts had to be taken down, they came away (a great deal of them) in the hands of the workmen, in basketfuls of mere dust and rubbish. I have, with my own eyes, seen that quantities of common clay were used in the construction of the upper portions of the fabric.

I believe that none of your correspondents have ventured to assail Lord Grimthorpe's work in one particular; and that is, in its magnificent solidity and strength. In careful selection of material, in scientific construction, in the minute attention expended on every detail, it has never been surpassed.

As to architectural taste, as distinct from mastery of building details, whether Lord Grimthorpe be "our only architect" or not, he is the only living architect who has given us original new work, and yet, at the same time, preserved the feeling and the genius of the best of the old. My most learned neighbour in these matters, who has published several excellent works dealing largely with architectural subjects, was struck with the same thought on seeing one of Lord Grimthorpe's churches, and expressed it in almost the same words. Stand at the N.E. corner of the St. Alban's nave, let your eye travel west over the exquisite Early Gothic, which is the prevailing character of the building as seen from that point, and unless your mind is jaundiced by professional jealousy, or blinded by the prejudice of the theorist, you cannot fail to be impressed with the perfectly harmonious, satisfying termination to the vista afforded by the superb west window. Then recall the anti-climax formerly presented by its hideous predecessor, with its flattened arch and gridiron "tracery."

When I contemplated, from the meadow on the south side, the daring conception of the "Five Sisters' Window," it seemed to me to present the very embodiment of that union of soaring grace with massive strength which is the characteristic of the "First Pointed" style. As for the aspersions levelled at the equally fine rose window in the opposite transept, they would apply with equal justice, as "Ars" has already pointed out, to some of the most magnificent round windows in Europe.

The story told by "A.S.S." about the bishop and the pulpit I do not believe one word of. I was present when the first sermon was preached from that pulpit by the Archbishop of York at the reopening of the nave in 1885. I was present at the luncheon which followed, and heard the venerable prelate propose the health of Lord Grimthorpe, or (as he was then called) Sir Edmund Beckett: "Surely," he said, "I am the most fortunate of bishops, for when my cathedral was tumbling down, a great layman came forward to build it up again! God bless him! God bless Sir Edmund Beckett for his good work towards this church!"

No one who bears in mind the very natural jealousy with which professional men regard amateurs; no one who has read the very outspoken criticism in Lord Grimthorpe's works on Building and Architecture of the leading lights of the profession, will feel the least surprise at the tone of most of the letters on this subject which you have lately published from them and from their sympathisers. Naturally enough, the better the work is, the more vehemently they will abuse it. In fact, we might expect to find in the fury of their attack the measure of its excellence, and, gauged by this standard, it is surely sufficiently high to please his lordship and his friends. But, knowing the sentiments of the bishop, as expressed above, I do sometimes wonder that he, and others connected with the diocese, who have the sense to appreciate what Lord Grimthorpe has done—the rector, for instance, who owes to his munificence the large and commodious house in which he lives—should so seldom take the trouble, when these attacks upon their benefactor are made, to come forward with one word of defence or of gratitude. Possibly it is because they think that his lordship is very well able to take care of himself—and there is, no doubt, a great deal to be said for this view. But, although I firmly believe that this, in many respects, the greatest work done in this age for his Church by a single individual may be safely left to the judgment of posterity—aye, even of the architects of posterity, when the jealousies of living men are forgotten—I nevertheless think that it is calamitous for that Church that so little appreciative gratitude has as yet been publicly shown by her representatives in the diocese of St. Alban's.

Two or three points remain, which have not, I think, been noticed by "Ars."

1. The new high-pitched roof, it is said, incloses a "cock-loft." Now, if there is any part of the restoration about which the critics have been practically unanimous, it has been that the flat wooden ceiling should be retained. If there has been an accepted axiom among church restorers, it is that depressed roofs should be restored to their original pitch. How were these two conditions to be satisfied without a void space being left? Even in churches with a high stone vault there is a "cock-loft," sometimes 20ft. high.

2. The arched sill of the west window (for which there is the best authority, by the way) "only supports," one of your correspondents tells us, "the mullions and glass." Does he know how thick those mullions are? They are calculated to sustain a large share of the weight of the superstructure. He might as well say that the base of a pillar only supports the shaft which immediately rests upon it. But the real object of the arch is to take the weight off the porch, which had led to disastrous results before.

3. The rosettes are "only bradded" into the hollow mouldings of the wind-porch. This would lead most unprofessional readers to imagine that all ancient oak decoration was carved in the solid, and that such work was necessarily the better for it. If so, they are mistaken in both respects; and I may add that the largest and finest piece of Gothic oak-work executed in this country since the Reformation, from the designs of the most eminent of the professional architects of this century, is studded with scores of these "rosettes appliquées." And all the better, for they can be carved out of carefully-selected, fine-grained fragments, and, when properly secured with glue and brads, will be likely to stand better than if worked in wood, of whatever density that part of the solid happened to consist of.

4. The substitution of square angle-turrets for round at the corners of the transepts was, I believe, due to the fact that a round turret is the weakest of all forms for such a position. As they were rotten, Lord Grimthorpe wisely substituted the better and more usual form when he rebuilt them.

5. A last word about the "Five Sisters' Window." Everything here has been done in strict conformity with the practice of the old Gothic builders, who, of all builders, were the most unfettered in their common-sense adaptation of means to their requirements. How often, for instance, they painted black the ground panelling of the fan tracery of the canopies of their stalls, to give the effect of open fretwork (a practice in which they have been imitated by the great architect alluded to above). Nor is there anything else about these windows to which the epithet of "sham" can be truthfully applied. The internal heads are what they profess to be—internal heads. The upper portions of the lights are actual windows, necessary to light the interior of the roofs. And I know of three instances of precisely similar treatment of windows—two ancient and one modern, but by a very great professional architect. Your correspondents ought to be able to show their knowledge of their own subject by pointing them out, and by furnishing more instances of the kind than can be supplied by one who is neither a builder nor an architect, but only

July 10. A Northern Vicar.

P.S.—In consequence of some of the remarks made about "Ars," I should add that this letter has been written entirely without the knowledge of Lord Grimthorpe.

FLATS AND DISTRICT SURVEYORS' FEES.—"KNIGHTLEY *v.* SHINGLETON."

Sir,—As your report only partially discloses the facts, permit me to supplement it.

The decision was against me, because the building in which the flats are arranged is less than 3,600sq.ft. in area. The law in one case defines flats to be houses, in another it decides they are not, yet each flat is entitled to the easement of support, to uninterrupted access and protection from the weather, and if a fire happened, and lives were lost, possibly actions might be brought against the owner for damages because he is not bound to use fireproof construction unless the area of his building is 3,600sq.ft., and as fires and epidemics are sure to occur, and as in such case the first person gibbeted might be the district surveyor, I grew alarmed and sought to make each flat a house. Had I succeeded, I would have compelled fireproof construction for every flat, regardless of the area of the building in which it might be situate.—I am, &c.,

T. E. Knightley.

2, The Grove, Hammersmith, July 16th.

Intercommunication.

QUESTIONS.

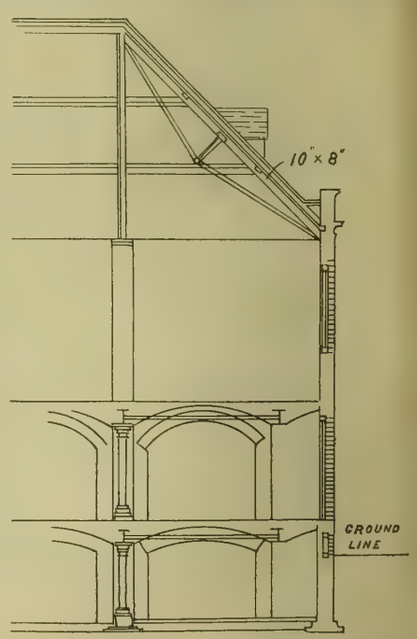
[10034.]—**Lead and Lime.**—Lead being supposed to be injured by contact with lime, is it a proper material to use as a damp-course in a brick wall built with lime mortar? or would the absence of the air in this case prevent the supposed destructive effect of the lime?—R.

[10035.]—**Destination Boards and Lamps.**—Will one of the many railway readers of "Ours" kindly give me a complete list of the "destination boards" carried on the front of the engines of the London and South Western Railway, and the corresponding lamps at night? Also those of the L.B. and S.C. Railways.—Constant Traveller.

[10036.]—**Architects' Charges.**—Some time ago I prepared plans and specification for three houses for a co-operative society, and superintended the erection of the houses, which were completed satisfactorily. The society had a copy of my plans for reference at their office, and when my specification was at their office for the inspection of builders, they made a copy of it without my consent. They have now let the contract for other two houses from my plans and specification (without employing me), and appointed one of their committee as architect. Can I claim anything for the use of my plans and specifications; if so, at what rate?—Provincial Architect.

[10037.]—**Gradient of Sewer.**—If a 24in. pipe sewer, laid at a gradient of 1 in 150 gives a velocity of 4ft. per second, what would the velocity be if laid at a gradient of 1 in 600, the pipe running half-full in each case? Will someone kindly inform a young beginner how the above is worked out?—Lancashire.

[10038.]—**Faulty Wall.**—I shall be glad of the opinion (through your valuable paper) of any person on the following subject. A large storehouse has been erected in the city of Oxford, supposed to carry enormous



weights; but through some cause the front wall has bulged; consequently, the architect advises his client not to pay the balance of amount of contract. Now, this wall is 40ft. long, and 33ft. high, and only 14in. thick, without any tie whatever; instead of which, it has to stand part of the thrust of two concrete arched floors, and a roof of which anyone can form his own idea from inclosed sketch. The opinion I am now asking is, Who is to blame—the architect or builder? I contend that the wall should have been double its thickness.—A Lover of Justice.

[10039.]—**Right of Way under the Altar.**—Can any correspondent tell me how it came to pass that the

ntifully groined passage-way, now used as a show-ce for the heap of human bones and skulls (supposed have been brought from the churchyards of neigh-ring churches) was constructed under the high altar Hythe Parish Church, Kent? Nothing now existing nd the church, nor the formation of the ground about seems to justify the idea that any ancient right of way l to be observed; and if this were so, why should the pas-e or crypt, as people wrongly call it, have been so richly ated with detached shafts in the purest form of h-century workmanship? At St. Gregory's, Norwich, re is, if I remember rightly, a passage-way under the ar, and at Walpole St. Peter's, in the same county, re is another similar instance which even more embles the arrangement at Hythe. Any information uld interest a large number of your readers, and par-ularly—A Churchman.

[10040.]—**Sewage Disposal.**—Can any reader idly give the name of the best work on the disposal of vage; showing details of sewers, settling-tanks, &c.?—MIAN.

[10041.]—**Sketching Tour in Devonshire.**—uld any of your readers give me a list of buildings in vonshire which would be of interest to the architectural dent? I intend sketching there for a fortnight or so, king Bradninch, near Collumpton, my headquarters. M.

[10042.]—**Testing House Drains.**—I should be id if some experienced reader of your journal could form me what is the most efficient way of testing house ains, and how the test is applied, both in the case of a wly erected and of an old house?—Inquirer.

[10043.]—**Open Spiral Staircase.**—I should be bliged for the names of any Renaissance examples of nding staircases in Germany, and if drawings or de-riptions of them have been published?—Escalier.

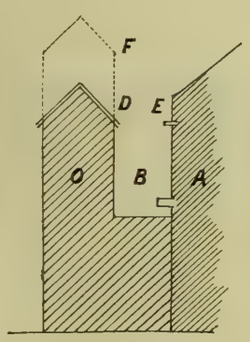
[10044.]—**Churches with Chancels not in the me Axis.**—Can any ecclesiological student furnish e with any noted example of divergent chancel, and the gree of obliquity it makes with axis of nave?—H.

[10045.]—**Competitions.**—I shall be glad of advice the following:—I was invited to send in plans in a nited competition, but was unsuccessful, and the draw-gs were not returned for three months after the award as given, and then covered with grease, dust, and dirt, d holes through. Have I any claim against the com-ittee? Nothing was said in the conditions to guard ainst responsibility; and the plans being in pencil, can-t be cleaned.—Outline.

REPLIES.

[10025.]—**Right of Light.**—"H. T." cannot build s house higher than his neighbour's window which over-oks the roof, as the latter, having enjoyed light over the of for over 20 years, has a prescriptive right of light. B. with any noted example of divergent chancel, and the gree of obliquity it makes with axis of nave?—H. rvient owner, and cannot do anything now to obstruct s neighbour's light.—G. H. G.

[10025.]—**Right of Light.**—You cannot now block o your neighbour's window; the fact of him (your eighbour) having enjoyed the light for 20 years constitutes is legal right to it. Had you done so earlier, i.e., within ne 20 years (which has now expired), there could have een no legal objection to your doing so. This is what ould have been done; but it is now too late. You can,



owever, carry up your building as per sketch, leaving a fficient space or well for light, so that your neighbour's ight is not seriously affected. There must be no mate-ial diminution of the light, or you may render yourself iable. The following is an extract from "Addison on he Law of Torts," it being already presumed that the window in question is an ancient light. "If a build-ng has been commenced which when carried up and inished will cause a serious obstruction to the passage of ight and air to ancient windows, the owner of the windows nay obtain an injunction to restrain the erection of the uilding; and there is no distinction in this respect etween houses in a town and in the country. . . And it as been held that the Court will not, as a rule, grant an njunction against the erection of a building *the height of which above an ancient light is not greater than its distance from the light.*" It is clear, therefore, that you have the ight to raise a building in front of the window; but the building must not be carried to any height. The distance D E being equal to D F, E being the top of the window.

[10026.]—**Warren Girder.**—The load is supported by the two centre struts; they are, therefore, in compres-sion, each sustaining half load. Each pulls down the strut next it, which therefore is in tension. The bottom flange is also in tension, and the two tensile struts cause the upper flange of end struts to be in compression. The lower flange in end bays receives half the tensile strain caused by the compression in end struts; in the centre bay the tensile strain is greater, produced by two centre struts, or one and a half times x.—G. H. G.

[10026.]—**Warren Girder.**—The stress in the flanges equals accumulation from stress on bars, the thrust of end bar, as in Fig. 94, produces downward thrust of $\cdot 866x$, and tension of $\cdot 5x$, as shown by Fig. 95. Also thrust of second compression bar in Fig. 95 produces tension $= x$ in adjacent bar and bottom flange, as shown by Fig. 92. The tension of $\cdot 5$ acts right through bottom flange, and must therefore be added to x in middle bay, making it $= 1 \cdot 5x$. In applying the parallelogram of forces, it is almost self-evident which bars are in compression and which in tension; the only difficulty that can occur is in such a case as in Fig. 101, at point d. The rule is that where two bars, meeting in a point, resist a force in a given direction applied at that point, the bars are both in compression if the force produced would pass between them, and if it would pass on one side of them the nearer bar is in compression, the other in tension. The reciprocal diagram for rafter, Fig. 119, is obtained, as all the others are, by drawing the load lines first, equal in length to the forces they represent—viz., C D, D E, then D A, E A, A B, C B. C D and D E are each equal to half the distributed load on rafter. Read the instructions on pp. 56, 57, and go through the descriptions of Figs. 115, 116, and 117 again. The load lines being drawn, the other lines in the stress diagram are obtained by finding the points in which lines parallel to those in the frame diagram intersect each other.—Henry Adams.

[10027.]—**Reverberation.**—One of the remedies is to break up the surfaces of walls. Lofty rooms with unbroken walls are liable to the effect of reverberation or echo. Drapery in the roof is found of value in checking the evil. I would suggest sounding-boards in preference placed across the angles of church near the pulpit, and frames of the proper size stretched with canvas may be tried in positions, and the results noted.—G. H. G.

[10030.]—**Damp-proof Course.**—If the architect does not approve of the substitution of another kind of damp-course, he can insist upon having what is specified, in the same way as if the builder put fir sills instead of oak.—H. L.

[10031.]—**Extras and Deductions.**—There are plenty of decisions; but it is difficult to give an opinion without seeing the contract and having all the circumstances of the case. Is there not an architect for the time-being of the owner?—H. L.

LEGAL INTELLIGENCE.

Flats.—At Hammersmith, on Wednesday, Mr F. Shingleton appeared to answer an adjourned summons at the instance of Mr. T. E. Knightley, district surveyor of Hammersmith, who claimed fees in respect of some flats which he had erected in Haarlem-road. The complainant claimed a fee in respect of each flat, contending that it was a separate building, but the magistrate decided against him, holding that there was only one building. A certain amount had been paid on account, which, according to the magistrate's decision, was in excess of the legal claim, and the summons was adjourned to give Mr. Knightley an opportunity to refund the money, the question of costs to remain in abeyance. Mr. Douglas Norman defended, and said a letter had been received stating that the question of fees could be arranged at the Court. Mr. Knightley said he was sorry the magistrate could not agree with him, but he had given him protection in case of fire. He then submitted an amended claim on account of concrete walls, amounting to £7 13s. 9d. Mr. Curtis-Bennett pointed out that on the former occasion the complainant agreed to £5 2s. 6d. Now that there was a decision against him a new claim was made. Mr. Knightley said he did not think of it. Mr. Curtis-Bennett bound the complainant to the first amount, based upon a calculation of the fees for the one building, and, as Mr. Knightley agreed to refund the excess, dismissed the summons without costs.

Not Under Seal.—Shipway v. the Brownhills Local Board.—This was an action by an engineer to recover a sum of about £800 for work. The defence of the board, besides disputing the amount, was that the work was not done under any contract or order under the seal of the board, so that there was no legal liability. Mr. Edwards was for the plaintiff, and stated that the counsel for the board had consented to judgment for £250. Mr. Jelf, Q.C. (with Mr. Archibald), stated that this was conditional on his lordship expressing an opinion that such judgment might be consented to. The auditor, unless there was such judgment, would object to the payment, and surcharge the board, as there was a legal defence. The counsel for the board, however, had considered that it would be rather hard to disallow the claim altogether, and so had agreed to consent to a judgment for the amount mentioned, £250, if the Court would sanction it. The Lord Justice said he thought that counsel under the circumstances might give such consent, and so he gave judgment for the plaintiff for £250.

Temporary Structures. — At Westminster, Messrs. Simmonds Brothers, of Newton-street, Holborn, represented by Mr. Donald Simmonds, appeared on Wednesday before Mr. d'Eyncourt to answer an adjourned summons at the instance of the London County Council for unlawfully erecting a wooden structure of a movable or temporary character in Halkin-street, Belgrave-square, for the occasion of the Duke of Portland's wedding, without obtaining the license of the Council for the same. Mr. Barton, solicitor, supported the complaint. Mr. d'Eyncourt, in giving judgment, said he agreed with the defendant's contention that the platform was not a building or structure within the meaning of the Act of 1855, but he did not agree with him that the amending Act of 1882 was not applicable. He would only impose a penalty of 20s., without costs.

WATER SUPPLY AND SANITARY MATTERS.

Sewage Farms in Australia.—Dr. Drysdale writes to the *Morning Post* as follows:—"In consequence of some letters on the agricultural utilisation of sewage which you were good enough to insert in your journal, I have this week received a report of the Melbourne (Australia) Commission which has recently been appointed to investigate the hygienic condition of that flourishing city. It appears from that report that whilst London still continues to be, as Lord Bramwell's commission worded it, 'a disgrace to civilisation,' by throwing the whole of the metropolitan sewage into the Thames at Barking and Crossness, the city of Adelaide has already a most successful sewage farm, which utilises in a most satisfactory manner the whole of the sewage of that city, to the greatest benefit of the public health. The city of Sydney also utilises a portion of its sewage on a farm at Botany. Melbourne is anxious not to be left behind by these two neighbouring cities of Australia, and accordingly has sent home for an able engineer to conduct an examination as to the best manner of utilising her sewage. Paris and Berlin have already most successful sewage farms, the former of which utilises a part of the Parisian sewage, whilst the latter utilises the whole of the Berlin sewage, and that there is no reason at all why London should not at once commence to utilise its sewage on the land. There lies before me at this moment a pamphlet by Sir H. Roscoe, who was consulted about the absurd tank erected at Barking, and the sludge ships to convey the solid part of London sewage out to sea. That gentleman writes:—'I am of opinion that the proposal of the Metropolitan Board of Works for the disposal of the metropolitan sewage is based on false principles. First, as regards the addition of lime and iron in the proportion recommended; second, as regards the addition of manganate of soda to the effluent after precipitation in the quantities suggested; third, as regards the formation of underground settling tanks at Barking and Crossness; fourth, as regards pumping the sludge into tank steamers, and sending it out to sea.' Here, then, we have the chemist whose opinion was sought by the Board of Works ridiculing its ruinous and useless plans. It seems to me that the County Council should at once examine the subject of the agricultural utilisation of the sewage at Paris, Berlin, Birmingham, Croydon, &c., and at once endeavour to free London from the reproach of appointing incapable persons to manage her affairs."

Sir R. Rawlinson and the Alnwick Sewage System.—At the Alnwick Local Board meeting last week (Councillor Chas. Percy, chairman, presiding) a letter from Sir Robert Rawlinson, touching on the sewage system of Alnwick, of which he was the engineer some 40 years ago, was read. He stated that he had read the "report on the death-rate of the district," and felt sorry that better results had not followed the cost of the local works. More, however, depended on local management than on works. As to the sewers, he asked whether they were fully ventilated, as, if not, this might easily be done by forming a vertical flue at the highest point of each main sewer and by a manhole severing the outlet sewer from the town sewers at the lowest point of the town sewer. A manhole would prevent any sewage gases from the main outfall sewer flowing into the town sewer. If it was not convenient to have the open grate above the manhole in the road or street, there might be side branch drains to take the gases out of the road. The local surveyor must think out the best way to ventilate the main sewers. No house drain should enter any house, but stop outside, and have full ventilation. Ventilation, he added, would not very much improve bad houses, and there were many of this sort in Alnwick. Let the Board mend those by new labourers' dwellings. Mr. F. R. Wilson, moved that the letter be referred to the Mortality Committee. It was most important as coming from such an eminent authority.—Dr. Candlish seconded, and it was carried, it being stated, in the discussion on the question, that the public sewers were as perfect as when they were first laid; there were faults only in the low-level down at Barney-side, and in the branches which had since been attached to the main sewers.—Ald. Robertson moved that the thanks of the board be conveyed to Sir R. Rawlinson for his opinion on that subject. He was the father of the sewage system of Alnwick, the engineer under whose guidance it was laid down, and he naturally took an interest in it. Besides, Alnwick, after Sir R. Rawlinson had accomplished the work, had been held up as a model for its perfect sewerage system. The motion, being seconded by Dr. Candlish, was agreed to.

Our Office Table.

The following is the result of the examination held at the Central Institute, South Kensington. The first prize, given by the Worshipful Company of Carpenters, was gained by Mr. A. B. Yeates, with 241 marks out of a possible 270. The second and third prizes, given by the lecturer, Mr. Banister Fletcher, were gained by Mr. A. Hale with 213 marks, and Mr. A. Corderoy with 199 marks. The following obtained first-class certificates:—Messrs. D. A. Ross, R. T. Hughes, H. G. Leslie, A. E. Mullins; and the following second-class certificates: Messrs. H. P. Fletcher, G. J. Carruthers, J. Baddock, H. S. Cregeen, H. H. Knight.

Ramsgate has a very generous Mayor in Capt. Vaile. The Corporation voted £780 to the borough surveyor as commission for preparing plans of the drainage and superintending the work. The law courts have decided, at the instance of the Ratepayers' Association, that the Council had no right to vote this money, and that it must be refunded. The surveyor, it may be remembered, lost his situation, and has since become insolvent, as the result of the action. The Mayor has decided to pay out of his own pocket the amount of the commission and legal expenses, a sum of about £1,400. The burgesses are starting a subscription to help to reimburse Captain Vaile, so if the surveyor's work was worth the money, the cost, after all, will be distributed over the whole borough.

Sir James Allanson Picton, of Sandyknowe, Wavertree, near Liverpool, died rather suddenly on Monday evening. He was present at the banquet at the Liverpool Town-hall on Saturday night in honour of the Shah of Persia, and attended church on Sunday. When he rose on Monday morning he seemed in his usual health; but between 10 and 11 o'clock he complained of being unwell. He so far recovered as to dissipate the fears of his friends; but just before 6 o'clock in the evening he had a relapse, and died before the doctor could be brought again, the immediate cause of death being stoppage of the action of the heart. The deceased, who was an architect, had been a member of the Liverpool Council since 1840. Sir James Picton busied himself a good deal with literary and antiquarian matters. It was largely through his zeal that the Free Library was founded, and he was chairman of the Library Committee until his death. He was the author of "Memorials of Liverpool," and some lesser books. He was in his 84th year. His eldest son, Mr. James Allanson Picton, is M.P. for Leicester.

There is a chance for ventilating engineers at the Court-house of Omagh. The county surveyor for the north half of County Tyrone has lately been trying to improve the ventilation of the Crown Court at Omagh, and the four hideous-looking black tubes carried up through the reporters' desks were aptly compared last week by Baron Dowse in his charge to the Grand Jury to four funnels of a steamboat. During the day the Court became warm, and the Judge ordered the covers to be taken off the pipes so as to ventilate the building. No one, however, seemed to know how to manage this, and after a search in vain for the county surveyor, the sub-sheriff and the head constable managed to reach the top of the pipes, from which they pulled what the *Derry Standard* calls "a deadly-looking contrivance composed of spring steel and pieces of tin, which Baron Dowse said they could put on their heads if they liked."

Architectural Association, 9, Conduit-street, W.—The Fifth Vacation Visit will take place on Saturday, July 27th, to Maidstone and Leeds Castle. Names, with postal order for 5s., to be sent to Mr. Ernest S. Gale, 5, York Buildings, Adelphi, not later than Wednesday, July 24th. Meet at Cannon-street at 9.10.

Frederick R. Farrow, Ernest S. Gale } Hon. Secs.

Trade News.

WAGES MOVEMENTS.

Bradford.—The Bradford plasterers struck work on Monday morning, owing to the refusal of their employers to increase their wages from 6¾d. per hour to 8d. We hear that the masters are not likely to hold out for any length of time, as many now agree to the terms stipulated.

Dundee.—The wages of masons in Dundee have been raised from 7½d. to 8d. per hour.

Inverness.—As the result of a conference between the masters and operative carpenters of Inverness, the masters have agreed to pay the standard wage of 6d. an hour to all their employés.

Leeds.—There are now very few men in the building trade out on strike. Close upon 100 employers have given the advance, and the men are confident that the struggle will be of short duration. Funds still come in briskly, and there are a great number of collecting lists still out. The single men continue to leave the town in great numbers, so as to give a better chance to those who are married and have families. The majority of the strangers who have entered the town during the strike have joined the Union, and come out with the strikers.

The members of the Streets Committee of the Commissioners of Sewers for the City have presented their past chairman, Mr. H. H. Bridgman, architect, with a silver tea-tray in recognition of his services. The principal event of the year was the approval by the commission of the committee's recommendation to light the whole of the City by electricity, tenders for which have already been received.

Operations have just been completed for the introduction of a new water supply for the burgh of Kingussie, N.B. Hitherto the water has been taken from the river Gynack. Plans were prepared by Mr. Roberts, C.E., Kingussie, and the contract was secured by Mr. Ross, Kingussie, at about £1,000. The new supply comes from Breakray Wells, three miles north of the town, and is supplied by gravitation.

To Municipal Authorities, Engineers, and Surveyors.

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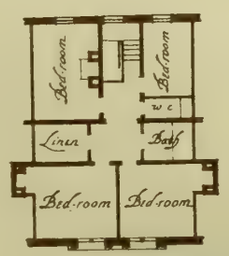
LIVERPOOL: 6 & 8, HATTON GARDEN.

GLASGOW: 47 & 49, ST. ENOCH SQUARE.

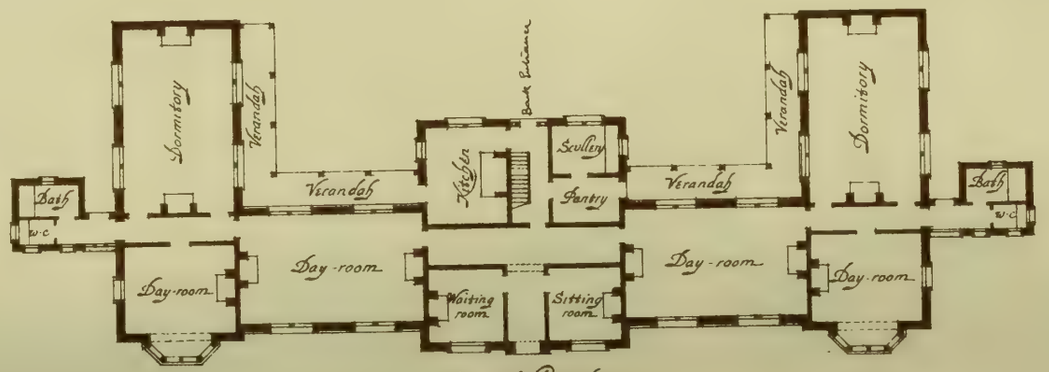
Childrens Hospital. CHEADLE ROYAL ASYLUM:



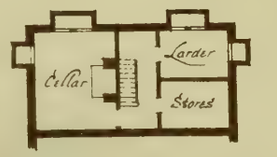
Front Elevation



First floor plan



Ground floor plan



Basement plan

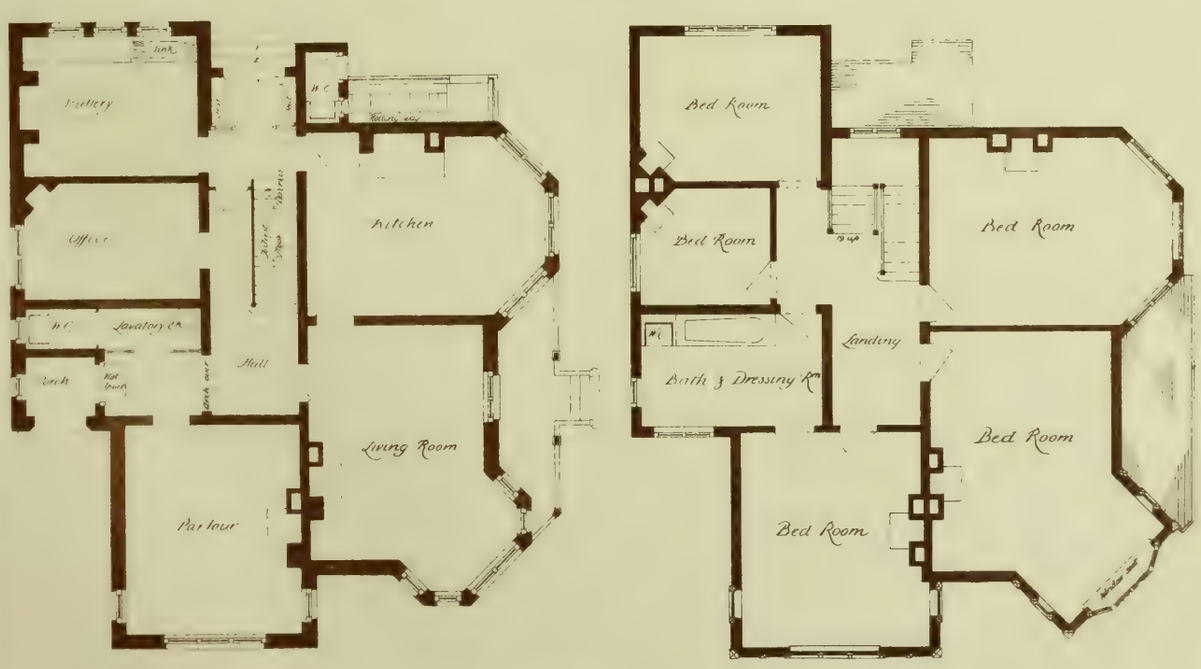
Bell and Koper
Architects.

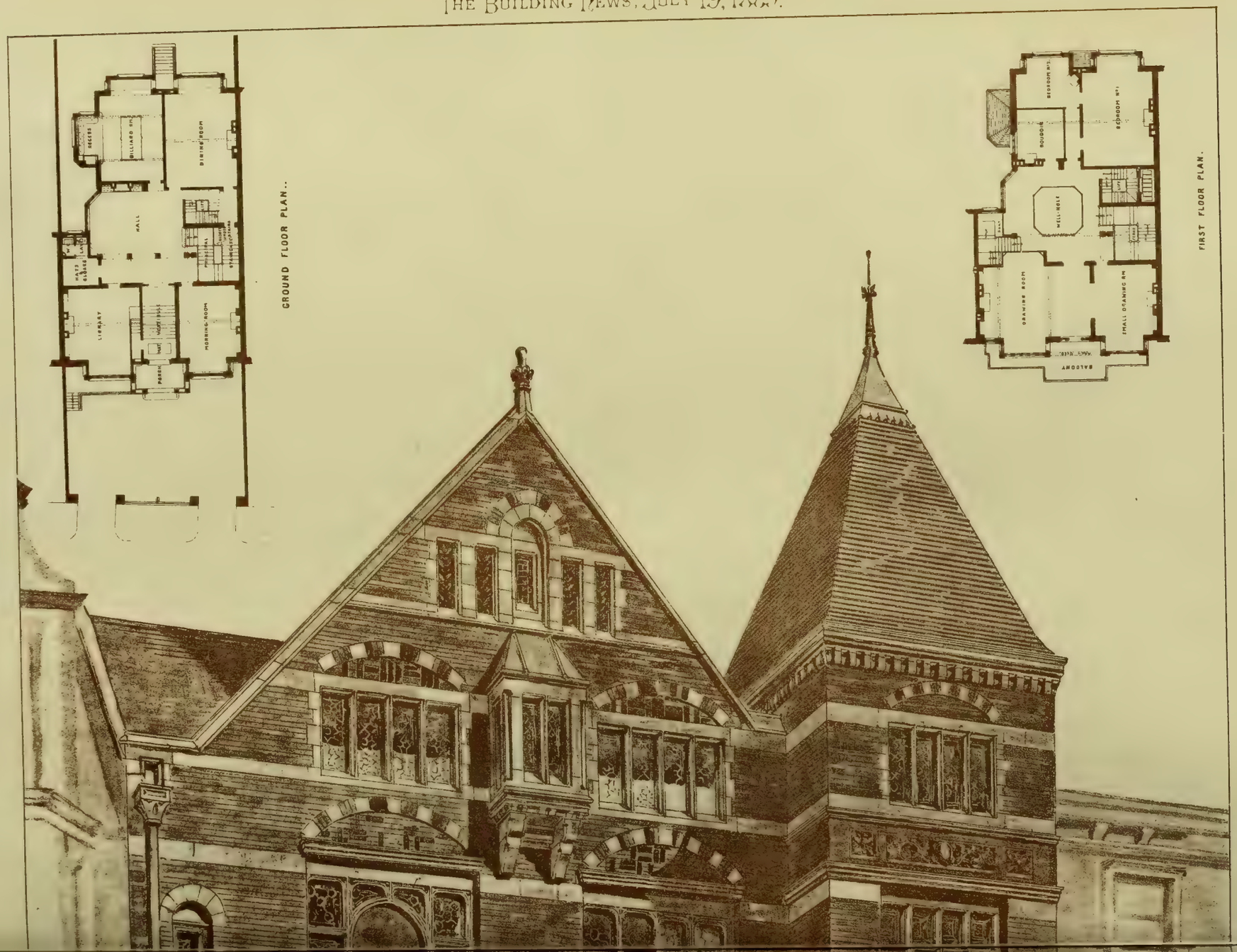
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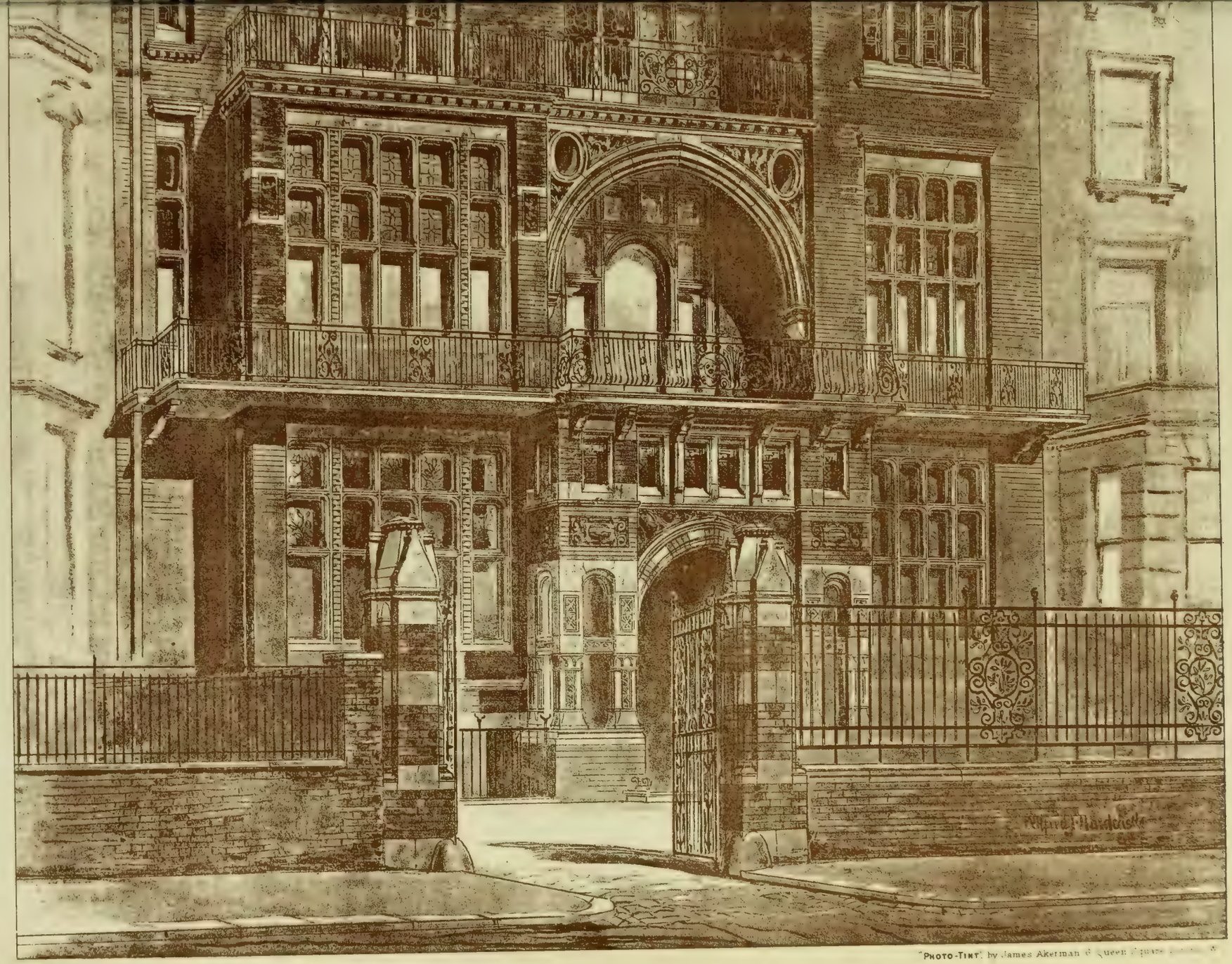


Farm-house · Hendon. J.T. Wimperis & Arber. Arch.ts

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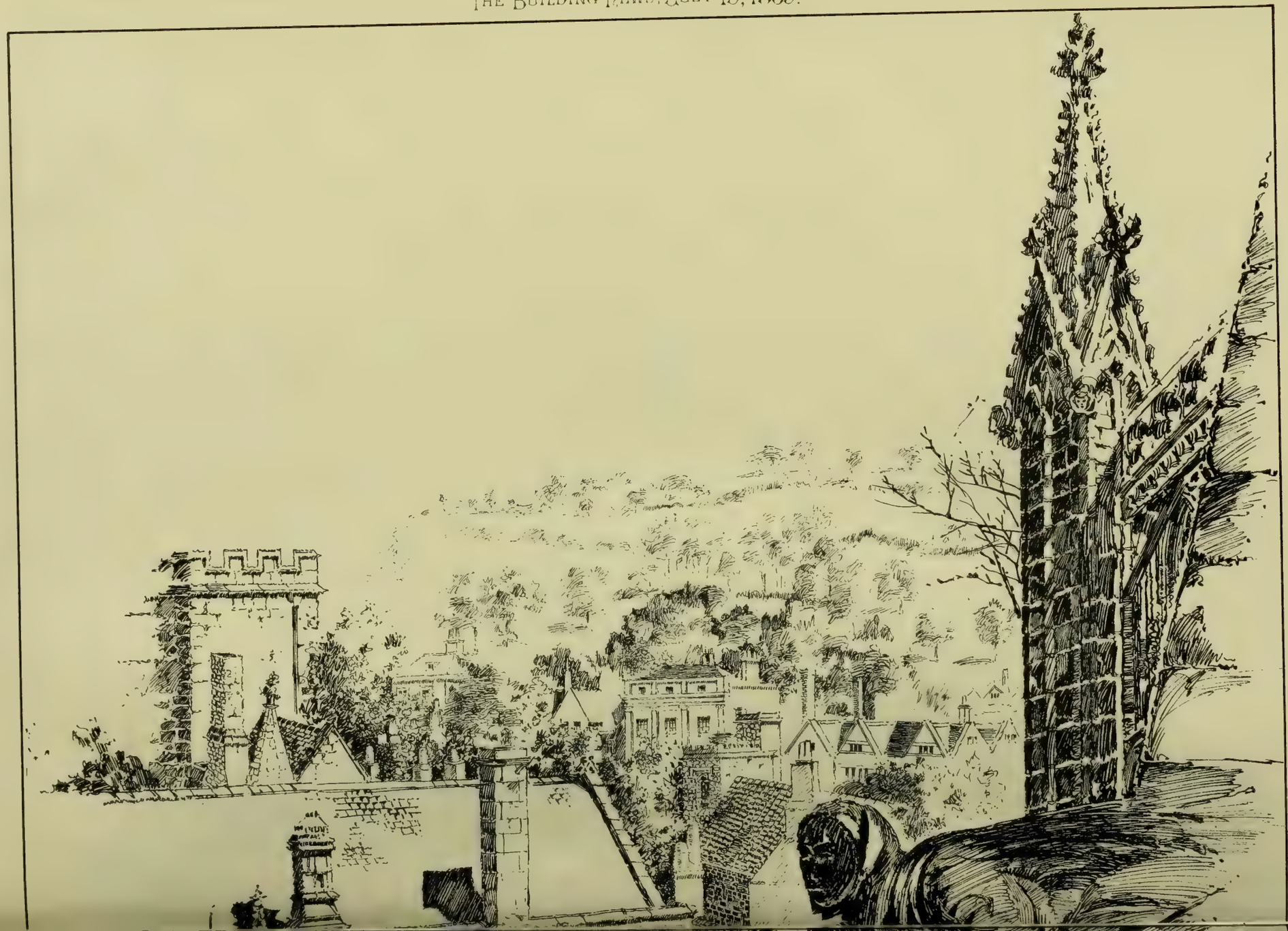



GROUND FLOOR PLAN.
FIRST FLOOR PLAN.



"PHOTO-TINT" by James Akerman 6 Queen [illegible]

Nº 2 · BAYSWATER HILL · W · W·J·HARDCASTLE · ARCHT



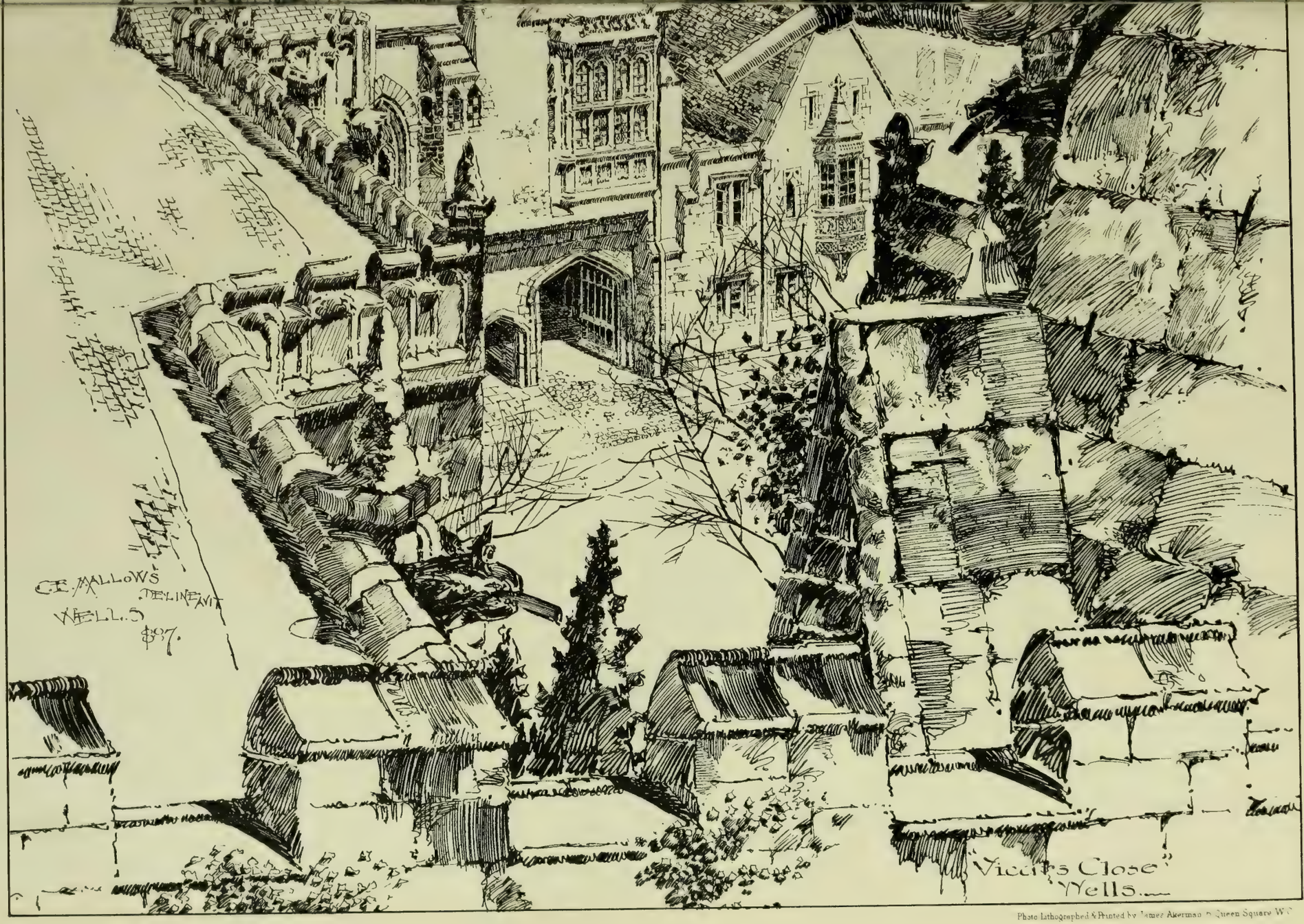


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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1803.
FRIDAY, JULY 26, 1889.

TYPES OF TOWN ARCHITECTURE.

MANY experiments in town architecture have been made since the Act for rebuilding the City of London after the Great Fire in Charles II.'s reign; some of them ingenious in the effort to obtain the essentials of space and light, others with no other object than to make an attractive exterior, and perhaps few cities can boast of the diversity of type and plan that there can be seen in London. Every style of architecture has been on its trial, every building material has been tested under the grimy smoke and damp, hazy atmosphere which has given the English metropolis a name amongst foreigners; every variety of expedient has been employed to increase the lighting area, and every conceivable whim indulged in to create a sensation in the monotonous miles of dreary streets. In the miles of stock brick and stucco of Bloomsbury one sees little to suggest that the designers of that gloomy locality ever had any but the most restricted views of architecture; but although the houses and squares do not inspire us with enthusiasm for the building of those days, they were at least the practical outcome of honest building and unsophisticated workmanship. The interiors and planning of these acres of town houses have at least one virtue—they are examples of commodiousness, convenience, and comfort, which are wanting in modern town houses. These merits must be set against their plainness and bare formality. But the era of these residences marks what we may call the great builders' era of the latter end of the 18th and commencement of the present century. Sir William Chambers is said to have designed many of the houses in Bedford-square. In Bloomsbury-square, a once fashionable neighbourhood in which stood Southampton House, the town residence of the Wriothesleys, and subsequently of the Bedford family, we have evidences of that careful internal planning and decoration which distinguish the earlier years of the Classic Revival. The houses in Tavistock-square and Woburn-place have the genuine Cubitt ring about them—massive, well built, and comfortable. Many other localities in London are of this dull brick-and-stucco type, distinguished for its stern baldness or dreariness, and passing under the cognomen of "Gower-street architecture." Here and there we see breaking through this regular and correct style of the large quarter known as Bloomsbury, the efforts of a freer art. Even the Dutch medley known as "Queen Anne" has made desperate efforts to obtain recognition in this citadel of frigid Classicism. Could a contrast be greater or more startling? The extremes of style in house architecture have here met; nothing looks more impertinent and saucy (to apply those terms to architectural manners) than to see a crazy, defy-all-rule style asserting its claims in the midst of the most regular and severest of structural arrangements that it is possible to find. The contrast is the more striking inasmuch as it is a pronounced protest against regularity and uniformity. The colour of the material and the style are both in opposition.

A more decided change of fashion has not taken place since the Gothic vagaries superseded the Italian, or since the epoch of of Louis XV. was exchanged for that of the Empire. The public have been gainers in some respects, but have lost in others. They have gained in variety what they have lost in formality. Red brick, once abhorred, has its day of retribution: it is no longer the despised and concealed material it once was, destined only for backs and flank walls; the proportion of solid to void, once a matter of rule, and governed to a certain extent by the old window-tax, is ignored altogether, for the observer of our street building may see attempts to produce entirely a glazed front, and to reduce the solid supports to the proportions of small piers. Again, regular features and horizontal lines which produced a stately breadth in our public squares and streets during the Hanoverian era, are no longer allowed to interfere with private rights and the individual fancies of builders. Like government and legislation, the tendency of modern architecture is towards what has been called the disintegrating policy, that of promoting individual interests at the cost of the State; the idea of Unity and State control permeated municipal architecture—a *regime* we find carried to an excess in Paris and many German cities. The assertion of the individual in the rebuilding of our streets is apparent to all who notice what has been done of late years.

The history of the shop-front is replete with evidence showing how the earlier Acts of Parliament have been overriden. The late Professor Hosking, referring to the Act of Charles II. framed by Sir Christopher Wren, drew attention to the way in which that statute was transgressed. The Act required the "outsides of all buildings in and about the said city to be henceforth of brick or stone, or of brick and stone together"; that "no bulks, jetties, windows, posts, or anything of like sort shall be made or erected in any streets, lanes, or by-lanes to extend beyond the ancient foundations, nor that any house be set further into the street than the ancient foundations, saving only that in the high and principal streets it shall be lawful for the inhabitants to suffer their stall boards (when their shop-windows are set open) to turn over and extend 11in., and no more, from the foundation of their houses into the street for the better conveniency of their shop windows"—that is, the shop-window board might be hinged as a flap, and turned out when the shop window was open as a stall upon which to expose goods for sale, and to be turned in when the window was shut. In time this stall board or turn-over flap became the fixed base to the projected bay window, inclosing the space allowed originally to the hinged flap. Again, the pent-house shelter which the Act required to be made over the paved footways had become the cornice to the shop front. In this way the "bulk" with windows was extended beyond the ancient foundations contrary to the statute. The professor observes after time had honoured the abuse by winking at it, the 12 George III. c. 73 made a bow window for the convenience of a shop an exception to the general prohibition of these projections. The projection of the stall board was limited to 5in. in narrow streets, and to 10in. in any street being more than 32ft. wide. The next Act, 14 Geo. III., altered 32ft. into 30ft., so that, in fact, the ill-advised concession in Charles II.'s reign resulted in making Cheapside, Ludgate-hill, and the Strand and all the older streets, 2ft. narrower than they would have been if the turnover stall board had not been made.

In this circumstance we have the origin of the projecting shop-front and its manifold abuses. Hardly a shop in any of the leading thoroughfares has not its projecting window and cornice—the development of the turnover stall board and "pent." It has been left to the present generation to make the most of this modern street excrescence. Sometimes it has been treated with ingenuity and taste, but it can never be made an agreeable addition to a front so long as its face of plate glass projects beyond the plane of the building above. The old pent form was more artistic: the pent roof was a more pleasing form than the modern cornice with its lead flat over, forming an awkward division between the shop window and the front. Moreover, the Statute of Charles II. intended the "pent" as a shelter for the public. Customers could see the goods under the shelter of the pent roof. The modern shop cornice only becomes a place for the emblazonment thereon of the proprietor's name.

The gabled front is a more important feature of our modern street architecture. Need we bring to the notice of the reader the new red brick buildings rising on the east and west sides of the Royal Horticultural Gardens site at Kensington, in Queen's Gate and Prince's Gate, Sloane-street, in Cadogan-place, Chelsea, Egerton Gardens, and other parts, which present that individuality of expression to which we have referred? In these wide West-end streets the Classic or Italian style has held supremacy. The frontages have been planned on straight, rectangular lines, as in Cromwell-road and adjacent cross streets; the perspective of façades, bounded by horizontal lines, is imposing, and remind one of the boulevards of Paris and some of the great cities of the West. But gradually this uniformity is being broken through; Flemish and Low Country features in red brick and terracotta are taking the place of the stone and stucco ornamentation.

In some parts, as in Cheyne-walk, Chelsea, in a block of large red-brick houses with horizontal parapet and curb roof, and with bay windows variously treated, the heavier features of the Georgian buildings are revived. Which of these two phases of brick architecture is likely to survive? A row of gabled houses in the Flemish style would look too broken, and almost as monotonous as the severer English type. The changes may be rung on different forms of gables; but if they were to be repeated along a whole street like Queen's Gate, for instance, they would be tiring to the eye by the unrestful skyline they would produce. Their unrestful and agitated effect is enhanced by the surface ornamentation, or their division into panels by brick piers or pilasters, and the need of strongly-marked horizontal members to counteract the impression. The vertical line is becoming as monotonous in the hands of the architect who is bent on giving us versions of Renaissance as the horizontal line domination was years ago. Notice the little brick vertical piers, sometimes corbelled out above the windows, or rising from the keystones of windows—they may become more irritating and subversive of rest than the horizontal articulations of Classic compositions. The bolder kind of engaged shafts which divide the gable vertically and break its skyline are less objectionable than the pilaster strip, as we see in the new red-brick façade of Argyll Chambers in the Strand, facing Southampton-street. We may point to the more palatial structure just finished near this building for the Tivoli Company to show the flexibility of the style. In this design a monumental character is given by the use of veined marble pilasters of one order rising through the principal stories enriched by gilt bronze-like capitals, friezes, and bands of relief. A certain repose and grandeur of scale are given to this building by the employment of the single pilasters which form the piers. Between these on the principal floors are flat mullioned bays corbelled over the arches of the ground-story shops. These windows occupy the entire width of the bays, giving all the light available—perhaps the most sensible way of treating a street façade of considerable frontage. The lines of cornice and attic add to the solidity and repose of the design.

Amongst the expedients used for gaining light and variety is the flat curved bay between piers, a good example of which is to be

seen in the City. The pilaster style, too, has its admirers. Under this mode the whole front is divided into narrow bays of windows, the wall is, in fact, broken up into a number of narrow pilasters. At the corner of Leadenhall-street is an instance, and amongst recently-built blocks we must notice St. George's House, Eastcheap, which is also cut up in the same way. Other peculiarities of style may be mentioned; those we have referred to are the main distinctions which mark the modern from past styles, and they show the possibilities of town architecture under the trying conditions in which it survives. We have no longer mass or solidity and repose, which could only be attained under the old Classical formula; but we have variety, play of light and shade, increase of lighting to our town buildings, and a diminution of the wall surface. These are the differentia of modern town architecture which are destined to form a new style.

LEVELLING.—XV.

BUILDING SITES.

FROM the example we last gave, we endeavoured to show how, for architectural purposes, such as making sections of building sites, a much more expeditious plan can be pursued than that ordinarily adapted by the leveller. In the plan we then gave we indicated the readings, not the reduced levels, as the simplest mode of proceeding; though before the section is prepared the reduced levels may be found. This is not necessary, however, when the levels are all taken from one position of the instrument, as in that case the line, or, rather, plane of collimation (i.e., the height of axis of telescope above the ground), becomes a datum plane from which all the readings are made, and any section can be plotted by taking such a line and setting off the levels vertically downwards. The plan, therefore, with the readings figured on every point of rise or depression is the most practicable form of fieldbook, inasmuch as one can see by looking at the plan the positions of the highest and lowest points, as well as the intermediate levels, and therefrom it is easy to draw any desired section.

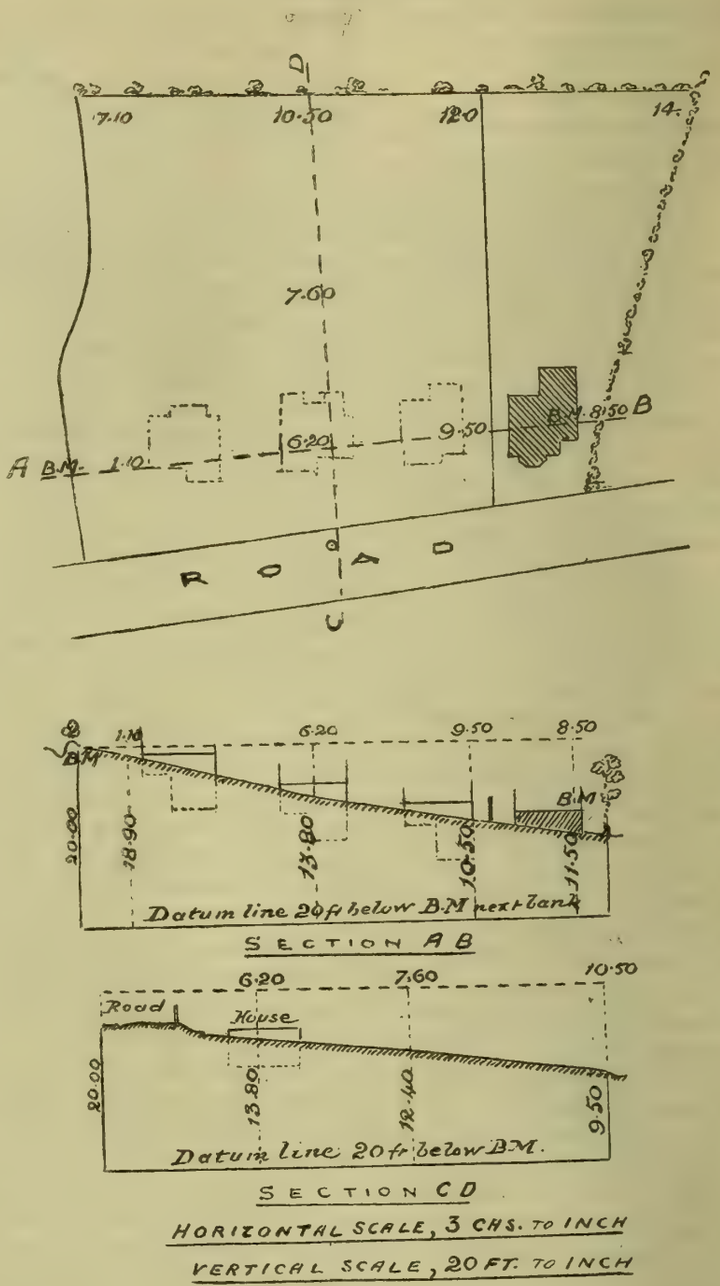
To illustrate this system more clearly, we give (Fig. 32) a plan of a building plot which has a considerable fall to one corner. This sloping piece of ground, taken from an actual survey, had a house at the lowest end facing the road, and it was required to take the levels of the remaining portion of the ground previous to the erection of three other detached villas, which are shown by dotted lines on the plan. The section was necessary for finding the amount of excavation for cellars and drainage. One was taken along the dotted line A B. A bench mark was temporarily fixed at the high end next the fence, and a stake was driven level with the ground. The instrument was taken to a point down the road about half-way between the boundaries, and adjusted till the cross wire cut the level of the ground or the top of stake, which was then fixed as the B.M. The first staff is placed about the centre of the plot to be occupied by the house, and its reading 1·10 noted on the plan. The next sight is taken to a staff held at the extreme corner at the back of plot marked 7·10, showing a fall from front to back of exactly 6ft.; the instrument is then turned on to the staff placed on the centre of second plot, the reading of which is 6·20; the staff is afterwards held up in the rear of house and reads 7·60, showing a drop of 1·40 to the middle of plot, and next at the fence at the back of plot, where it reads 10·50, indicating another fall of 2·90, or a total fall of 4·30 from front to back. The level is then turned to a staff held at the other corner at the back, and the reading 12·0 recorded. The staff is next held on the position for the third villa where the reading is 9·50. Of course, any other intermediate levels can be taken; but these few suffice for the plot. It is better to take the back readings, 7·10, 10·50, 12·0, and 14·00, at once, as the staff-holder has then merely to shift the staff from one point to the other before taking the three front levels. The last level recorded was taken on a level with the ground-floor of the house already built, and read 8·50, and this formed a convenient bench-mark, and might have made the beginning instead of the B.M. already described. Along the line of section A B there is a fall of 8·50 to the ground-floor, or 9·50 to the ground itself; and if the whole distance is, say, 3 chains, or 198ft., the gradient would be about 1 in 20. On the line C D another section was made. The levels of ground-floors being fixed on reference to the slope of ground, the excavations for the cellars can be determined, as shown by dotted lines in the sections.

It will be noticed that the levels are all taken from the plane made at the height of axis of telescope, which thus forms a datum plane, level with the highest point of the ground. The ground-floor levels are fixed by stakes, from the tops of which the depths of excavation are found. The readings 1·10, 6·20, and 9·50 are taken from the staff held up respectively from the surface of the ground, and at these points also stakes are driven level with the ground. To avoid mistakes, it is a good plan to identify each of these with tickets having the reading written upon it. An excavation made at the side of it to the depth required ought first to be made, from which the depth of the remaining part can be gauged.

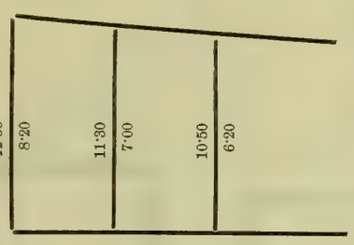
In setting out gradients for drain trenches a range of boning-rods should be set up close to the stakes first driven, and parallel to the bottom of trench. The workman ought to be provided with a rod of a certain length—the depth required—by which he may gauge the bottom of the trench at intervals. Holding up the rod vertically at intervals, it should be made to range with the tops of the boning-rods already fixed.

We have already explained how the depth of a trench for a drain can be determined, and

Fig. 32



we must ask the student to refer back to our instructions on this head. The length of the gradient being divided by stakes at equal distances apart, the fall is divided by the number of divisions, the quotient thus found being added consecutively to the datum levels, and marked on the section on one side of the vertical lines with the reduced levels on the other, thus:—



The difference between 12·50 and 8·20, and between 11·30 and 7·00, &c., is 4·30, and this gives the depth of trench, and can be marked on the section between the line of gradient of the trench and the surface of ground; the stakes should have the depth marked upon them.

THE LEASEHOLD SYSTEM, AND ITS ALLEGED ADVANTAGES.—I.

THE Report of the Town Holdings Committee is too voluminous to enable us in one short article to say all that we could say about the recommendations of the committee. Our readers are aware of the opinions we have always held respecting the expediency of enabling leaseholders to purchase the freehold, the facilities the system of leasehold tenure has given to dishonest building, and the unfairness with which landlords claim or confiscate all improvements made by the leaseholder, to say nothing of the exorbitant ground-rents and reversionary rights of landlords. And all these views we have held without going so far as to countenance Mr. Henry George's very radical measures. The committee's labours appear to have been very exhaustive, and to have covered a wide field. During the season of 1888 alone thirty-eight witnesses were called, representing various towns in England and Wales, including many agents of noblemen and numerous solicitors and landowners, and this fact is to be particularly remarked. The Session of 1887 was taken up with evidence relating to London. In short, the Select Committee was appointed in 1886, and has been at the work ever since. But after reading the recommendations of the report, we are obliged to confess we are very little better off, for the pros and cons are so nearly balanced, that the alleged advantages and disadvantages become conflicting to one who desires to obtain the real facts. Fortunately, the evidence collected and the divisions taken during the thirteen sittings of the committee throw collateral light on the very equivocal phrases of the report, and it is worth notice that 169 divisions were taken, many of them from party motives.

It will far exceed our limits to enter into the various tenures upon which houses are built in England and Wales, which is the first division of the report. Five principal tenures are referred to (1) the freehold system; (2) the fee farm or chief-rent system, where the land is granted in perpetuity subject to a fixed annual payment; (3) the long-leasehold system of 999 years, or other long term, where the land is let at an annual rent; (4) the system by which the land is let at a rent for terms of 99 years and under, and this is the leasehold system as generally understood and referred to; and (5) the life lease system. The distribution of these tenures throughout England and Wales is of interest. In Yorkshire and Lancashire the freehold and long leasehold prevails, and the same rule generally applies to Lincolnshire, Derbyshire, Shropshire, Staffordshire, Herefordshire, Worcestershire, and the Eastern Counties, Hertfordshire, Berkshire, Kent, Devonshire; while in London and its suburbs, and many towns in the South and West of England, leasehold tenure is the rule. In other towns freehold and leasehold both exist.

We deal here chiefly with the recommendations of the committee in the third part of the report, respecting the expediency of enabling leaseholders to purchase the freehold, and also the question as to the effect of the leasehold system on building. The remedies proposed for the grievances arising from the present system are weak and indecisive. Contrary to the generally received opinion that tenants should receive a fair compensation for improvements to town houses and holdings, the Committee are not favourable to any reform; they observe that the "increase of value of premises has been too much attributed by the tenants to the improvements made by them, without making sufficient allowance for the advance in the value of the site." Upon this ground they support the rule that the landlord is the rightful possessor of improvements at the end of the lease. We cannot agree with the assertion that the claims of tenants for these improvements are frequently taken into consideration by landlords or their agents in fixing the terms of renewals of leases; nor does the observation that "as a rule the value of tenants' goodwill is not considered in fixing the rent," hold good in actual fact. We know of cases where the rent has been increased on that ground alone. Our readers, in short, cannot wonder that the Committee are not prepared to recommend any relief to tenants under existing contracts by reason of either improvements or goodwill.

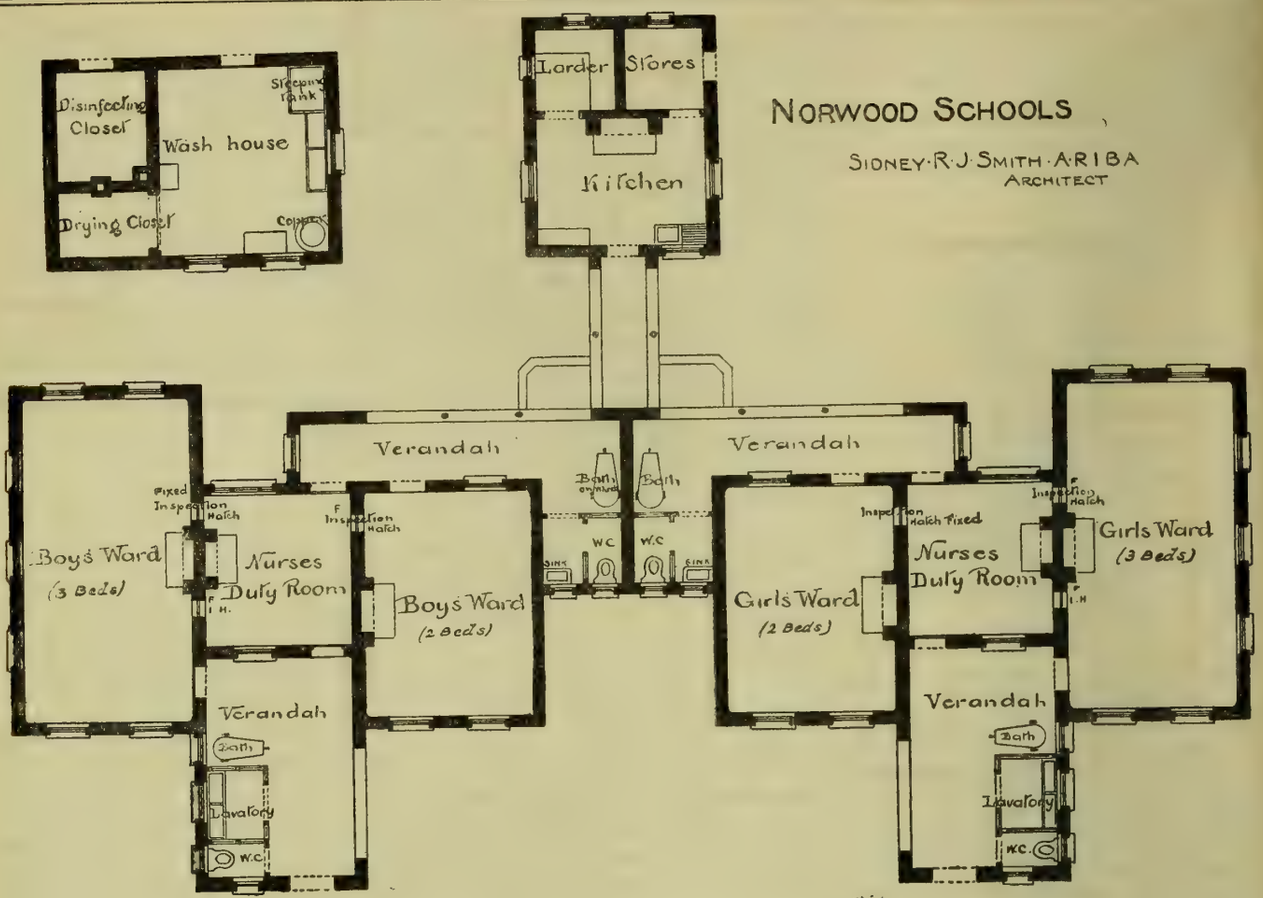
The suggestions as to the future are of a very guarded character, and the remedies hedged round by conditions that will not make it easy for a tenant to obtain recognition of any improvement. For example, the Committee limit the right to compensation to trading and business premises; but this right is to be safeguarded—that is, the landlord is to have power to check any alterations he thinks undesirable, or that may be injurious to him; in short, the conditions so restrict the tenant that he is practically little better off than at present. The suggestion that a tenant of business premises or a dwelling-house may be allowed to effect improvements with the written consent of the landlord, and be entitled to compensation at the expiration of the tenancy, will virtually be to withhold the landlord's consent to alterations in many cases, and practically to defeat the object, instead of facilitating the making of improvements.

Passing to the third division of the Report, which deals with the expediency of giving leaseholders facilities for the purchase of the fee simple, the charges against the system and alleged advantages of it are here considered, especially with regard to its effect on building. To our minds this is one of the most important bearings of the question. The evidence given by several witnesses, especially that of Mr. Castle, a land agent at Oxford; Mr. Bray, a solicitor, Redruth; Mr. Rhodes, chairman of the local board, Beckenham, in support of the view that leasehold discourages the erection of houses and limits the supply of houses, somewhat conflicts with the actual facts; and we believe it rather to be the facilities offered to speculators under the leasehold system that induce such scamping in the quality of the building. At the same time we agree with Mr. Redruth and Mr. Castle that land would be disposed of easier if it was possible to obtain freehold or a right of renewal on reasonable terms. The distinction we draw is that private building owners prefer freehold land, while "jerry" builders thrive on leasehold tenure, and this is the strongest reason why legislation should assist the former class, and so check the trading speculation of the other. Mr. Trevail, M.S.A., architect, of Truro, states that in various parts of Cornwall there would be much greater development of building if freehold land could be readily obtained. There had been little house-building in Truro on account of the shortness of the tenure; but now facilities for longer terms were obtained, building was increasing. The leases in Cornwall are chiefly on lives, and are therefore thought to have no bearing on the leasehold tenure question. Mr. Yates' evidence is important, and bears directly on the question of building. He observes that, as the builder on leasehold "has to borrow at a higher rate of interest than if he had the freehold, his operations are restricted, and rendered more costly"; consequently the supply is diminished, and the rents are higher. He says the result is that the occupiers in the suburbs of London pay 10 to 12 per cent. more rent than they would if built on freehold land. This is true when the buildings are honestly built; but the majority of small builders on the leasehold system are not deterred by the higher interest, as in many cases they do not pay it for long; besides which, they require less capital than if they had to buy the freehold site.

On the whole, this part of the evidence bearing on the discouragement of building, strangely conflicts with the evidence on the other side. Mr. Ryde, the well-known surveyor, for example, remarks, as the result of long experience, that building land is more quickly and advantageously developed under a system of leases. We should paraphrase the remark as "quickly and disadvantageously." Mr. Ryde's evidence that London would not have extended so rapidly if the system of leasehold had not prevailed is, in our minds, a more conclusive argument for leasehold enfranchisement than against it. No doubt whatever can exist that leasehold tenure has facilitated the covering of land with inferior houses, though to what extent it has benefited tenants we fail to see. It is the rapid development of estates that has inflicted injury on whole suburbs of London. Mr. Tewson's evidence that leasehold went off "ten times as quick" as freehold cannot be disputed; but the question is whether the advantages to building and tenants have been in the same ratio?

The conclusions of the committee are in harmony with what we might have expected: they think "that the plan of letting land upon an annual rent, which is the leading feature of the leasehold system, possesses considerable advantages and convenience," but they offer no proof. They conclude that except in places where the sentiment of the district is strongly opposed to leaseholds, houses are built and estates developed more rapidly on the leasehold system than on that of freehold purchase, and that occupiers obtain the benefits of lower rents and greater opportunities of selection; "but there is no evidence that towns where the freehold system prevails have suffered in consequence." The latter sentence is an ominous admission. The long leasehold and fee-farm systems are also recommended.

The second sub-heading of this section refers to the effect of the leasehold system on building. The evidence of Mr. Harrison, who gives Lancaster Gate as an example of the pernicious effect of leasehold on building, is to the effect that leasehold houses are worse built than freehold, owing to the fact of there being no "fag end" of leases or terms on freeholds as on leaseholds. "The 'fag ends' are got hold of by persons who rack-rent the property, letting it out on weekly and other



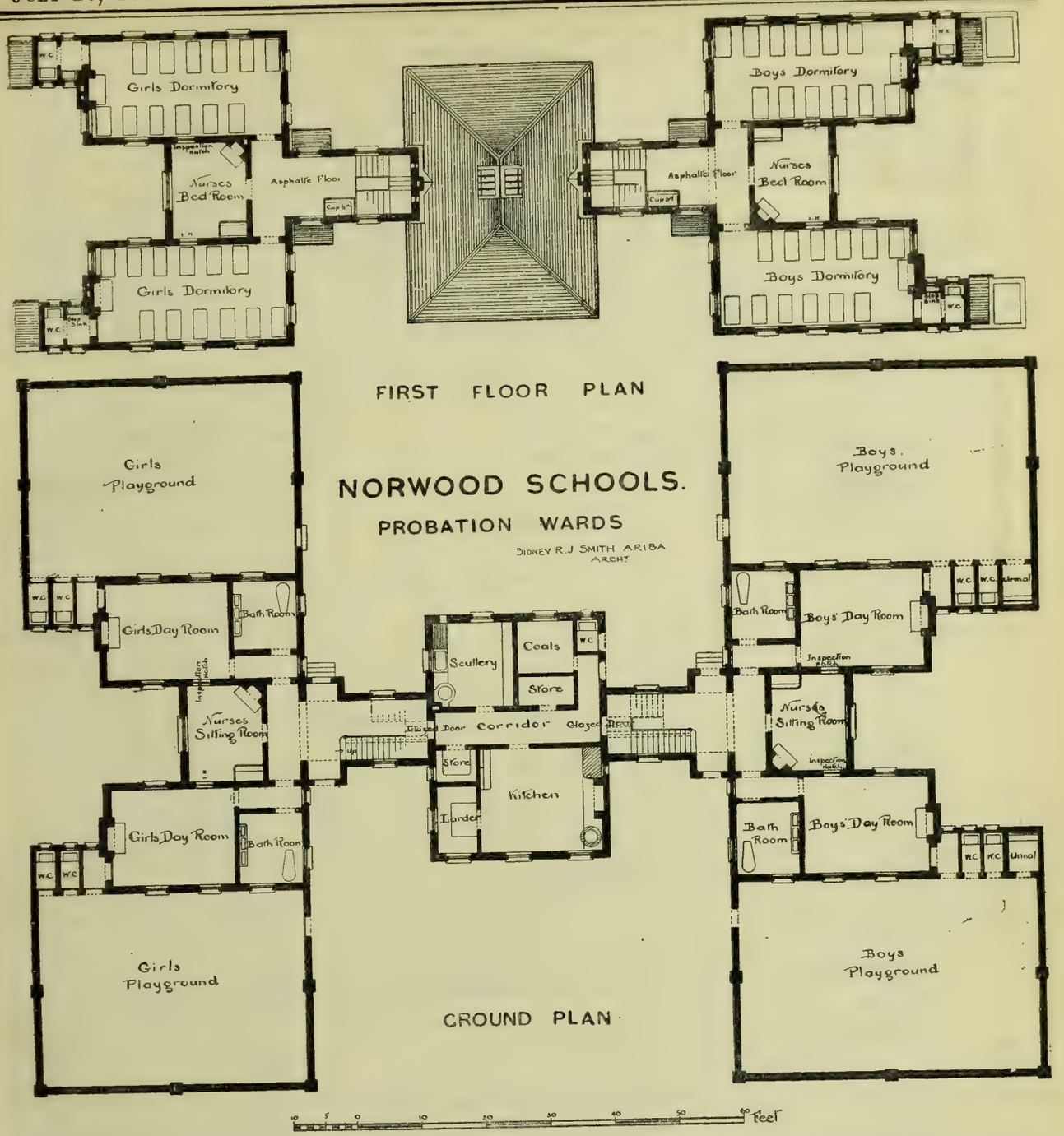
ISOLATION WARDS.

small tenancies." Mr. Castle, of Oxford; Mr. Green, of Woolwich; Mr. Rhodes, of Beckenham; Mr. Fatkin, of Leeds; Mr. Simpson, of Sheffield, give evidence to the effect that leasehold property is of the poorest kind, and that short terminable leases are injurious to good building. Mr. Trevail, of Truro, explains the reason—viz., that buildings put up on leaseholds are put up to last only for the term for which they are built, and of the cheapest construction. Mr. Wright, of Nottingham, decidedly gives preference to houses built on freehold as being better built and a better class of property. On the other side, Mr. Ryde maintains that a man who builds on leasehold land has the freeholder to look after him who is interested in the reversion of the houses. The same reason is advanced by Mr. Vigers, while Mr. Tewson says the worst class of houses in and near London are found on freehold building estates, the builders being free from restrictions. Other witnesses think the nature of the tenure has little or no effect upon the character of the building. As to the supervision of the freeholder and his surveyor having a good effect on leasehold erections, no clear proofs are furnished, the reason being that the freeholder is too anxious to get his land covered to put any stringent restrictions into operation. The conclusion of the committee is of the same indecisive and conflicting character with respect to this point. They say "they cannot fully adopt the conclusion contended for on either side," and they think the nature of the tenure has little to do with the quality of houses erected. They proceed: "We think that any system under which the builder obtains the land without the expenditure of capital, to some extent affords facilities for the operations of the *less substantial* and *more speculative* class of builders; but there is no evidence to show that this class of builder is not found carrying on operations in freehold towns; nor does the evidence lead to the conclusion that a comparison between freehold and leasehold towns would clearly indicate that leasehold tenure has had a bad effect on the class of houses erected in, and the sanitary condition of, the towns in which such tenure prevails." The two latter members of the sentence quoted singularly contradict the assertion italicised.

Referring to shorter terms—as 60 years and under—the Committee frankly admit that less substantial houses are built. The whole of this second paragraph is equivocal in meaning. They further say that the state of maintenance and repair of houses depends not so much upon tenure as upon the character and position of the landlords, lessees, and occupiers, while they wind up by acknowledging that a freehold occupier has a stronger motive to keep his property in order than the leaseholder.

In conclusion, we believe that a fair measure of enfranchisement will do much to check the overcrowding of our suburbs, for it will take away that eager desire to which some ground landlords are prone, to part with their land by letting it on lease with the object of obtaining as many houses as they can upon it. Upon this point the committee in their report admit the tendency the leasehold system is to encourage building. They say, "As regards excessive rents, we are not inclined to think that leasehold enfranchisement would have any appreciable effect on reducing them; and, as before stated, we think that the leasehold system rather facilitates the building of houses, and so increases the supply." No doubt of this; and it is the very evil which a better system of tenure would prevent. The houses that are built are far in excess of the demand, as every house-agent in any locality knows. The hitherto existing leasehold system has encouraged the excess of house supply in two ways: first, by supplying a field for the speculations of builders who wish to obtain profit on house-building; and secondly, through the instrumentality of solicitors and agents, who derive, in many cases, considerable incomes and fees from builders and others mainly by obtaining advances and in drawing up mortgage deeds.

We cannot enter now into the other questions raised in the report further than to say that the opinion of the Committee is very embarrassed. While granting that the conversion of leaseholds into freeholds would promote improvements and encourage the development of trades, they hesitate to accord the measure of enfranchisement any support. We are ready to admit that it is only fair to secure to the reversioner the full value of his property and compensation; but there is no reason why this would necessarily obstruct any measure of useful reform. Nor can we see there is any strong objection to the measure. To say that it will prolong the existence of old houses which ought to be pulled down, and that it will discourage and prevent improvements of a public character, is to urge very trifling objections to the general good of the principle. Another fictitious objection raised is that such an Act would be taken advantage of by lessees, and that it would tend to convert the middlemen under whom the working classes hold into freeholders. As to the recommendation made of a local application of enfranchisement, or some plan for facilitating the acquisition of the freehold by leaseholders on limited areas in which there are a large proportion of leaseholders of the industrial classes who are able and willing to purchase the reversion of their properties, we can only say that it appears to us to amount to an acknowledgment of the advantages to be derived from a measure of which so tardy and piecemeal an instalment is offered.



If the scheme is worthy of adoption on a small scale to a certain class, why should the scheme not be applicable to the whole country? The alarm seems to come from owners of ground-rents and reversions, who do not like to be exposed to the piecemeal purchases of their property, but who have a keen regard to the value of the reversions and improvements made by tenants.

NEW PROBATION AND ISOLATION WARDS, NORWOOD SCHOOLS.

THE plans which we publish to-day show some new buildings which have recently been erected for the Lambeth Guardians, and in which the endeavour has been made to insure proper classification and economy in working.

The probation building accommodates forty-eight children, twelve being in each ward, with a nurse centrally situated, so that each side is under complete supervision. The plans were approved by the Local Government Board, and all their requirements have been complied with fully. The lavatories have been fitted up with a new glazed stoneware trough (suggested by the clerk of works, and manufactured specially by Messrs. Stiff and Sons), and have jets over, with union valve for hot and cold water. The baths are not cased, but enamelled outside, and the lavatories tiled and lined with glazed bricks. Each building has a disinfecting oven and receiving-room for clothes.

The isolation wards are to receive children from the school infirmary who may show any signs of having infectious or contagious diseases, and to completely isolate them. The wards accommodate ten children, and the plans show clearly the arrangement, a nurse being situated between two wards with fixed inspection hatches, and the wards are so arranged that there is no direct communication between them, so that each form of disease can be kept entirely distinct. Attached to the building is a laundry and disinfecting oven, constructed so that beds can be properly disinfected. The wards are all ventilated with Sherringham and Boyle's ventilators. The drainage has been carefully seen to, and is thoroughly ventilated, with inspection chambers at each junction with glazed channels. The tender for the buildings was £7,178, and this has been exceeded very little. Mr. J. O. Richardson, of Albert Works, Peckham, was the contractor. The clerk of works was Mr. Geo. Crowter, and the buildings were executed from the designs and under the superintendence of the architect to the schools, Mr. Sidney R. J. Smith, A.R.I.B.A., 15, York-buildings, Adelphi, W.C.

Prince George of Wales visited Mottingham, Kent, on Wednesday week for the purpose of opening the new buildings to be occupied by the Royal Naval Schools. The premises are of white bricks with Portland-stone dressings, and were built as a private residence by the late J. Hartley. At his death they were purchased by the governors of the Royal Naval School for £26,000, and a further sum of £9,000 has been expended on refittings and alterations, under the direction of Mr. A. B. Hutchings, architect.

The exhibition of the works submitted for the National Art Competition, 1889, by the Schools of Art throughout the Kingdom, will be opened to the public to-morrow (Saturday). The works will be on view in the Enamels Gallery of the South Kensington Museum. The Exhibition will remain open until the end of August.

Mr. Thomas Savin, of Oswestry, formerly a railway contractor, and one of the chief pioneers of railway enterprise in Wales, died on Tuesday, aged 66. Mr. Savin took a leading part in the projection and construction of the Cambrian Railway.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—XLVIII.

By Henry Lovegrove, F.S.I., Surveyor.

THE next subject in this series is a Lych Gate, to form the appropriate entrance to the burial-ground of a country parish.

The illustration with the details will fully explain the design, and a student should have no difficulty in following the process of arriving at the estimate.

Estimate for a Lych Gate and Boundary Walls to a new Burial Ground in a Norfolk Parish.

	ft.	in.	ft.	in.	
		15 0			Red tile ridge bedded and jointed in Portland cement.
2	15	0			Broseley tiling and ¾in. deal battens for do. and laying, and 1in. sawn English oak, V-jointed boarding to form ceiling to roof.
		9 9			
			292	6	
4	9	9	39	0	Portland cement filltg. to tiling and pointing to verge.
4	9	9	39	0	Labour and waste, cutg. to tiling at end.
2	15	0	30	0	Add at ridge.
2	15	0	30	0	Ex. to double co. tiles and cement at eaves.
					1 Ex. labour cutting and fitting ridge tiles to finial.
					1 wrought-iron finial to design 5ft. 3in. high, with rod, bolt, and fixing in oak 2ft. 3in. across.
					1 Ex. labour cutting and fitting ridge tiles to base of finial.
	1	0			
	2	8	2	8	7lb. lead dressd. to base of finial.
4		10	3	4	Labour cir. cutting to do.
					All the following to be in sawn English oak framed together with oak pins :—
24	9	3			
		6			
		3	27	9	Oak framed rafters.
					24 Sprockets out of 6in. by 3in., and 1ft. 9in. long.
					24 Ends of 6in. by 3in. rafters cut circular.
2	14	9			
		8			
		6	9	10	Oak framed tie-piece.
					4 Circular cut or moulded ends to 8in. by 6in.
					4 Oak framed blockings splayed out of 6in. by 5in., and 2ft. long.
2	5	9			
		6			
		3	1	5	Oak framed collar.
2	11	4			
		9			
		6	8	6	Add.
					4 Wrought cut and moulded chamfered ends to 9in. by 6in.
2	11	6			
		11			
		6	10	6	Oak framed posts at ends.
4	3	4	13	4	Splayed cutting on 6in.
4	3	7	14	4	Add.
					4 6in. oak wrought framed curved struts, 4ft. 6in. long, 12in. extreme width.
					4 oak framed cut brackets out of 9in. by 6in. by 1ft. 9in.
					4 6in. oak framed curved brackets, 5ft. 1in. by 1ft. 6in. extreme width.
2	5	11			
	1	0			
		6	5	11	Oak framed sill.
					4 moulded ends to 6in. by 6in.
2	5	11	11	10	Bedg. 12in. by 6in., oak sill on stone coping.
4	1	6	6	0	¾in. W.I. bolt.
					4 H. nuts and washer.
					4½ holes through 12in. stone for ¾in. bolt.
					4 ends of bolt counter sunk in oak.
	14	3			
		6			
		4	2	4	Oak framed longitudinal tie.
	14	3			
		11			
		6	6	6	Add.
					2 4in. oak framed brackets 15in. by 15in. extreme size, cut circular front edge.
	14	3			5in. by 4in. oak framed tie.
	5	6			
		6			
		6	1	4	Oak framed cross tie.
	8	6			
		6			
		6	2	2	Add post in centre.
					4 4in. oak-framed brackets, 3ft. 3in. long out of 12in. wide cut circular front edges.
	5	0			
	1	6			
	0	6	3	9	Oak sawn slab.
	13	0			Labour rounded edges to 6in.
					No. 4, Quadt. rounded edge to 6in.
					4 brass friction rollers and plates let into oak slab and fixed with screws 2in. wide, 3½in diameter.
4	1	0	4	0	¾in. wrought-iron bolt, and (2).
					4 H. n. and w.
					4 ¾in. bolts let in and run with lead to stone.
	4	6			
	1	3	5	7	Bedding oak slab on stone wall in cement.
4	4	6	18	0	4 by 4 oak-framed gate post.
12	1	6	18	0	¾in. wrought-iron bolt.
					12 H. N. and W.
					12 Building in ¾in. bolt in wall.
2	3	9			2½in. oak wrought framed dwarf gate in 3 panels, the upper one open, and fitted in with square framed bars, the lower panels square framed, but chamfered on bottom rail; all put together with oak pins.
	4	0	30	0	
4	2	10	11	4	Labour to chamfer on mid. rail.
4	2	10	11	4	Labour to forming reeding on top rail.
2	2	10	5	8	Labour rdd. edge to 2½in. top rail.
					2 rounded ends to 2½in. stile 6in. wide.
					2 do. corners to do.
					2 pair 3½in. butts.
					2 wrought iron ornl. latch, with twisted drop handles and four oils.
2	6	10			
	1	6			
	1	0	20	6	Sand stone in coping to side walls.
4	4	10			
	1	6	29	0	B. an l J.
2	6	10			
	1	6	20	6	Plain face.
2	9	10			
	1	2	22	11	Moulding.
2	5	7			
	1	2	13	0	Stopd. do.
4		5			
	1	2	1	11	
					8 Extl. mitres to mdg. 14in. gt.
					4 Intl. do. do.
4	1	6			
	1	0			
	4	0	24	0	Stone as last in quoins average.
4	5	6			
	1	0	22	0	B. and Jt.
12	1	6			
	1	0	18	0	
4	1	6			
	4	0	24	0	Plain face.
8	1	0			
	4	0	32	0	
2	1	3			
	1	0			Stone as last, quoins to centre wall averaged.
	4	6	11	3	
2	5	9			
	1	0	11	6	B. and Jt.
6	1	3			
	1	0	7	6	
4	4	6			
		6	9	0	Cir. sk. face at angles.
2	1	3			
	4	6	11	3	Plain face.
4	1	0			
	4	6	18	0	
2	1	2	2	4	Cir. sk. face to form circ. panel.
					2 Carving maltese crosses in cir. sk. panel 10in. diam.
2	2	10	5	8	Circ. mdg. 1½in. gt. in sk. panel.
	2	6			
	4	6	11	3	Wall of local flints 15in. thick in cmt.
2	2	6			Ex. to facing with cracked flints and
	4	6	22	6	pointing in random courses.
2	4	10			
	4	0	38	8	Flint wall at bottom 18in. thick.
2	3	7			
	4	0	28	8	Ex. to flint random facing a. b.
2	4	10			
	4	0	38	8	
2	7	7			
	1	0	15	2	3½ bk. in ct. footings side walls.
2	6	10			
	1	0	13	8	2 bk. in ct.
2	9	4			
	4	0			
	1	6	112	0	Dig and cart and concrete.
2	9	4			
	4	0			Dig and cart, part filled in and
	2	6	186	8	rammed.
	4	3			
		9	4	0	2½ bk. in ct. footgs. cement wall.
	5	3			
	1	3	6	7	1½ bk. in cement.
	6	8			
	3	4			
	1	3	33	4	Dig and cart and concrete.
	6	8			
	3	4			Dig and cart a part filled in and
	2	6	55	7	rammed.
2	6	10			Asphalte damp co. and spreadg. in
	1	6	20	6	wall.
	4	6			
	1	2	5	3	Add.

Bill.

EXCAVATOR AND BRICKLAYER.

Yds.	ft.	in.		£ s. d.
5½	0	0	Cube. Dig and cart	
9	0	0	,, Do. part fill in and ram	
5½	0	0	,, Concrete	
	64	0	Sup. Reduced brickwork in cement, including rough cutting	
1¼	0	0	,, Wall of local flints 15in. thick in cement	
4⅓	0	0	,, Do., but 18in. do. do.	
10	0	0	,, Extra to facings with cracked flints, and pointing in random courses	

ft.	in.	ft.	in.	£ s. d.
26	0	,,		Asphalte damp course ¾in. thick, and spreading in walls
6	0	,,		Bedding oak slab on stone wall in cement

Sqs.	ft.	in.		
12	0	Run.		Bedding 12in. by 6in. oak on stone coping
				No. 12. Building 18in. long in wall

TILER.

2	93	0	Sup.	Broseley tiling laid to a ¾in. gauge, and fixed with galvanised iron nails
	69	0	Run.	Labour and waste cutting do.
	39	0	,,	Portland cement filletting and and pointing to verge
	30	0	,,	Extra to double course of tiles at eaves
	15	0	,,	Red tile ridge bedded and jointed in Portland cement
		No. 1.		Extra labour cutting and fitting ridge tile to finial
		No. 1.		Do. do. to base of do.

Ft.	in.			
56	0	Cube.		Sand-stone, and half sawing and setting
88	0	Sup.		Labour beds and joints
106	0	,,		,, plain face
9	0	,,		,, circular sunk face
2	6	,,		,, stopped do.
23	0	,,		Labour moulding
15	0	,,		Do. stopped do.
6	0	Run.		Do. moulding 1½in. girt in sunk panel
	No. 8.			External mitres to moulding, 14in. girt
	No. 4.			Internal do. do.
	No. 4.			Holes through 12in. stone for ¾in. bolt
	No. 4.			¾in. bolts let in and run with lead
	No. 2.			Carving maltese crosses in circular sunk panel 10in. diameter

Sqrs.	ft.	in.		
2	93	0	Sup.	¾in. deal sawn battens for Broseley tiling
2	93	0	,,	1in. sawn English oak and jointed boarding to form ceiling to roof
				All the following to be in sawn English oak, framed together with oak pins.

CARPENTER AND JOINER.

Ft.	in.			
4	0	Cube.		Sawn slab
76	0	,,		Framed rafters, &c.
30	0	Sup.		2½in. wrought and framed dwarf gate in three panels, the upper ones open and fitted in with square framed bars the lower panel square framed, but chamfered on bottom rail
28	0	Run.		Labour splay cutting on 6in.
11	0	,,		Do. chamfer
11	0	,,		Do. forming reeding
13	0	,,		Do. rounded edge on 6in.
6	0	,,		Do. do. on 2½in. rail
				No. 2, labour rounded corners, do.
				No. 2, do. do. ends, 6in. wide
18	0	,,		4 by 4 framed post
14	0	,,		5 by 4 do. tie
				No. 4. Ends of bolts countersunk
				No. 4. Quadrant rounded corners to 6in.
				No. 24. Ends of 6in. by 3in. rafters cut circular
				No. 4. Cut circular or moulded ends to 8in. by 6in.
				No. 4. Wrought, cut, and moulded ends to 6in. by 6in.
				No. 4. Do., do., do., to 9in. by 6in.
				No. 24. Sprockets out of 6in. by 3in. by 1ft. 9in. long
				No. 4. Framed blockings splayed out of 6ft. by 5in., and 2ft. long
				No. 4. 6in. framed struts 4ft. 6in. long, 12in. extreme width
				No. 4. 6in. cut brackets out of 9in. by 6in. by 1ft. 9in.
				No. 4. Curved do., 5ft. 1in. long, by 18in. extreme width
				No. 2. 4in. brackets 15in. by 15in. extreme size, cut circular front edge
				No. 4. 4in. do., 3ft. 3in. long, out of 12in. wide, cut as last
				No. 2. Pairs 3½in. iron butts, screws, and fixing
				No. 2. Ornamental wrought-iron latches with brass handles
				No. 4. Brass friction rollers and plates let into oak slabs and fixing with screws (2in. wide and 3½in. diameter)

Qrs.	lb.		
2	16		Wrought iron screw bolts and fixing
			No. 1. Do. finial to design 5ft. 3in. high, with rounded bolts and fixing in oak 2ft. 3in. across
	19		Milled lead dressed to finial

SMITH.

Ft.	in.		
3	6	Run.	Labour circular cutting on do. (7lb.)

PAINTER.

28	0	,,	Two oils on iron bolts
	No. 1.		Four oils on iron finial

A new stained-glass window, representing several scenes in the Life of our Lord, and intended as a memorial of the late Lord Hatherton, C.B., was unveiled in St. Mary's Church, Stafford, on Tuesday.

The foundation-stones of a new Primitive Methodist chapel were laid at Royston, South Yorkshire, on Monday. The chapel will seat 500 persons, and is being built from plans by Mr. G. Moxon, of Barnsley.

WAYSIDE NOTES.

THE little competition announced from Cromer should elicit responses of a wholesome nature. A small town-hall always "draws," and whole batches of plans are contributed by the younger branch of the fraternity, whenever this description of edifice is wanted. I suppose it is because there is no great amount of ingenuity and resource, or of knowledge of any special character required to produce plans and elevations for such a work of architecture. Memories perchance of Viollet le Duc's *Histoire d'une Hôtel de Ville*, combined with observations in any accessible buildings, and a fulsome cribbing from back numbers of the "B..N.," suffice for the production of a mass of draughtsmanship that the assessor mechanically throws aside. Unless, therefore, the combined effects of the holiday season and the perusal of these notes should deter a large number from entering the struggle, this Cromer competition will prove of that nature wherefrom the profession, as a whole, gains more cuffs than ha'pence. It does not follow, however, that the successful competitor should not make a good thing of it; for besides the job, there is a chance of considerable work in the future at Cromer. Since the time when a large tract of building-land was here put up to auction the place has progressed, and the accelerated train services of the energetic G.E.R. Company have brightened the prospects of the once retired little Norfolk fishing-village.

It should, therefore, be worth the while of many young, and some elderly, architects, to pull off a competition that may give them a footing in a town likely in the future to be the scene of considerate developments. The prospects of the affair itself may seem small and insignificant in themselves. The funds at disposal are not extensive, and the plans have to be in by about the middle of August. £1,200 is the limit of expenditure allowed; and a vast amount cannot be done with that sum in hotel-de-ville building, although, perhaps, it would be sufficient to provide several humble structures of the type of that to be found in one of the "Sweet Auburns" of the Isle of Wight—Bonchurch, if I remember aright. But a town-hall is a wonderfully good introduction to future architectural operations in a watering-place; and, *en passant*, I would give this advice to young architects desirous of establishing themselves in any particular locality:—Look out for a chance of competing for some local work, go in and win, and follow up the foothold obtained. Citizens and townsfolk think a "wonderful deal" of the architects of their own public buildings, especially their town-hall. I have seen the benefit the fortunate competitor thus gains, and am prepared to maintain that on this principle an architect best gets the thin end of the wedge in a town, and with much more success than comes of purchasing practices and partnerships.

The long-proposed Parliament-street improvement scheme may be at last expected to come off. Subsequent to the second reading of the National Portrait Gallery Bill, in the Upper House, Lord Lamington asked a question relative to these alterations and improvements; and many will be glad to hear that in less than a month the Board of Trade may issue a certificate stating that the requirements of the Bill, authorising a private company to carry out the said works, have been fulfilled, when there will be nothing to do but go ahead. Having omitted to follow the details of the scheme, I am not in a position to say whether the proposed improvements are for better or worse, so upon that point will only remark that it seems curious that an undertaking of this nature should be left to private enterprise, and not undertaken by the local governing authorities. In the matter of public expenditure on architecture and building we seem to be going from bad to worse. Public spirit would appear to be a thing of the past.

It is certain, however, that something is required to be done to make the approach to the Houses of Parliament more dignified. Excepting this end of Whitehall and Parliament-street, the thoroughfare is wide and impressive. True, it is, that the Charing Cross end is somewhat contracted; but this is unavoidable. From good King Charles's grimy statue to a point about opposite Inigo Jones's masterpiece, it gradually widens till it becomes one of the broadest, if not the very broadest, street in London. Could it but be continued at this breadth, a fine prospect of the Victoria Tower would be afforded. At present the block of houses that juts out abruptly just past the Home Office spoils the effect. Those old buildings, it is to be presumed, are coming down, and will then open up a broader view of Henry VII.'s chapel and the eastern end of the abbey. To really produce a fine effect and give a grander *coup d'œil* of the Victoria Tower, the east side of Parliament-street should take a new alignment. Clear away the block between Parliament-street and Cannon-row, set out a new building line, and pull down the block over the way, and there would be an approach to our House of Legislature worthy of the building and its adjoining pleasant square—a really fine and most cheerful site, which cannot be said of the square popularly styled "the finest site in Europe." All these improvements may, or may not, be included in the contemplated works. If not, I am always ready to admit that clearings in our midst cannot be carried outside the bounds of common-sense.

Open spaces are most admirable and indispensable in their way; but some persons would have us convert the whole of London into an open space, which is reducing the thing to an absurdity. Lord Meath writes to the *Standard* of the 24th and complains of the action of the authorities in letting the Post-office people have the site of the Coldbath Fields Prison for purposes of erecting new buildings connected with the department. A central sorting office is here contemplated, as explained in Parliament on the 19th by Mr. Raikes on the occasion of the second reading of the Post Office Sites Bill. Lord Meath, as chairman of the Metropolitan Public Gardens Association, urges that the 8½ acres which this Coldbath Fields site covers should be turned into an open space. It is a great benefit that there should be someone on the alert to take advantage of any opportunity for forming new open spaces for the recreation of the masses; but the principle may be carried too far, and, where public buildings are concerned, may be quite out of place. The class of builders to oppose in the cause of open spaces are the constructors of leasehold houses on the wholesale plan. It is far better for the land to be uncovered than spread over with rotten houses, and bearing this principle in mind, the Metropolitan Public Gardens' Association will be able to do inestimable good to Londoners. But to oppose the erection of a public work of such importance as a post-office is to earn condemnation as faddists, which they should not truly deserve.

The report of the Town Holdings Committee can scarcely be said to be so satisfactory as one could have wished. It would appear to have been most difficult to obtain perfectly unbiased opinions from every individual member. Each appears to have been influenced by the vested interests of either the ground landlord or the advocates of leasehold enfranchisement. Perhaps one of the most commendable clauses in the report is that of the chairman, which affirms that the conversion of leaseholds into freeholds would promote improvements and encourage the development of trades and business. There is not much doubt about this. The leasehold system of tenure does more than anything else to deaden industry; or, it would perhaps be more correct to say, the effect of the leasehold system of building is most harmful to trade. The French say that when building goes all goes. There never yet was a briskness in miscellaneous markets when the building trade has been bad.

The Hankey's Folley extensions progress in defiance of anyone and everyone. The same selfish-looking, gaunt, hideous masses of walling are rapidly rising, and soon our famous London "sky-scraper" will be a monstrous creation indeed, blocking out the light and air of hundreds of persons dwelling around, spoiling the distant prospect, and rendering itself one of the most remarkable monuments of the day. Its notoriety, however, is scarcely to be envied, being of that order which comes to the great criminal in the police-court. A more barbarous construction I never saw; and one may here employ the word barbarous in its true sense. A so-called barbarian will build to himself a hut, and in his own way spend time, and what skill he may have, in rendering it "ornamental." Whatever may be the result, he has had a good and proper intention. The barbarity of the abortion near the St. James's Park Station consists in the fa that not one particle of respect is shown for the feelings of the beholder of the building, and not one penny expended on aught but that which will increase the amount of the rents obtained. "Filthy lucre" reigns supreme.

Colonel North has expended vast sums in many various ways, so it is only to be supposed that sooner or later he would endeavour to provide himself with a more sumptuous mansion than that which he has long had at Avery Hill, Eltham. And for some time operations have been carried on at that place with this end. The gallant Colonel returned to England, after his American travels, a few days back, and has found his residence at Avery Hill in process of being transformed into a small palace. Under the direction of Mr. Thos. W. Cutler the old building has been rapidly altered and extensive additions have been made, that will be worthy of the "Nitrate King." Sculpture galleries, with columns and pilasters of rare onyx and rich marbles, splendid reception-rooms, and every possible luxury of a country mansion are being provided. Extensive winter gardens adjoin the house, and stables will, I believe, be shortly completed for the colonel's stud. And I understand that there is a little private Turkish bath included that will be a gem, as beautiful and fairy-like as pure white and coloured marbles and rich-toned faience can make it. To press forward these extensive works Mr. Cutler and his contractors have been indefatigably labouring for months, so that the building might be in as complete a state as possible when Colonel North returned; and though I believe many things remain yet to be completed, the end has been attained, and the colonel has arrived at Avery Hill to be charmed beyond measure with his new abode.

I much regret to have to say that "A Northern Vicar's" views of St. Alban's Abbey and its arch destroyer are beneath contempt. One cannot afford to alienate the sympathies of any clergyman with the architectural profession. The intelligence and heartfelt interest exhibited by all clergymen of the Church of England in matters architectural is unspeakably refreshing, where so often we have, with others, to put up with crass ignorance or blind contempt. But "A Northern Vicar" should carry his studies a little deeper before essaying to support the opinion of men ignorant of every true principle of architecture. His letter will cause all readers to smile. Effusions of this nature are the outcome of that "little knowledge" which is "a dangerous thing." Let "A Northern Vicar" return to his architectural studies, and in the course of years essay once more, with greater caution, to treat of architecture in a journal for architects.

GOTH.

CHIPS.

A sketching visit of the South Wales Art Society was made to Castell Coch on Wednesday week, and was largely attended by members.

At a special assembly of the Royal Society of British Artists, held on Tuesday evening, the following gentlemen were elected members:—Messrs. W. D. Almond, Frank Brangwyn, Nelson Dawson, F. Hamilton Jackson, James Macmaster, R.S.W., Robert Morley, C. Mottram, Laslett J. Pott, Adam E. Proctor, Octavius Rickatson, F. Cayley Robinson, R. W. A. Rouse, Henry Sykes, W. Harding Smith, William Strutt, H. T. Schafer, and W. H. Y. Titcomb.

On Saturday Mr. Arnold Taylor, one of the inspectors under the Local Government Board, held an inquiry in the town-hall, Todmorden, the local board having made application for powers to borrow £5,872 for paving, sewering, &c., private streets, and also the sum of £1,500, for the purpose of purchasing land for sewage outfall works.

The foundation-stone of a new Baptist Chapel for East Kirkby, Notts, was laid on Saturday. The buildings will be of brick with stone facings, and will seat 500 persons. Messrs. Booker Brothers, of Nottingham, are the architects, and Mr. Firth, of Kirkby Folly, is the builder.

The Lambeth Vestry have decided to contribute £20,000 towards the purchase of Brockwell Park, on condition that the scheme for the purchase of Raleigh Park is abandoned. The total amount required is £122,000, towards which the Charity Commissioners have promised £25,000, and the London County Council £61,000; £2,500 has been contributed by private subscriptions, the total reaching within £13,500 of the amount required for the acquirement of the property as a public park.

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OUR LITHOGRAPHIC ILLUSTRATIONS.

THREE PREMIATED DESIGNS FOR GLOUCESTER MUNICIPAL BUILDINGS.

We give reproductions to-day, from the drawings sent us by the municipal authorities of Gloucester, in illustration of the 1st, 2nd, and 3rd premiated designs chosen in this competition by Mr. Alfred Waterhouse, R.A., P.R.I.B.A., the professional referee, whose award has now been confirmed by the city council. The selected design by Mr. G. H. Hunt, of Gray's Inn ("Ad Rem") has a façade rendered in a phase of the Renaissance style, which, from its quiet dignity and the refinements of its detail, is considered by the author as the best for a public building of this quality. Painswick Hill stone is proposed for the general ashlaring, and Hampton Common stone for the base and exposed portions of elevation. For the entrance hall and gallery over it vitreous mosaic is to be used, and the corridors are to be stone-paved, the council-chamber, mayor's parlour, and committee-rooms having pitchpine floors in narrow widths. Wainscot oak is intended for the fittings of the best apartments. The roof over the large hall is of iron construction, and all the roofs are to be slated. The plans given illustrate the general arrangements, which are divided into three main departments—viz., (1) the offices; (2) the council-chamber and committee-rooms; and (3) the public hall and its accessories. The first-named are arranged on the ground floor for easy working and ready access. The council-chamber is placed on the first floor in the front, and the public hall is situated at the rear on a slightly lower level. This disposition has the advantage that, whilst the offices are kept entirely distinct, the other two departments can be used separately and independently, or together for conversaziones, entertainments, or other purposes, with entrances both from Eastgate-street and New Inn-lane. Considerable ingenuity is displayed in this design in the planning of the two different levels, by which additional height is gained for the front elevation, while the back part is kept down for the sake of economy. The estimated total cost is stated by Mr. Hunt at £15,473 4s. 4d. The two other prize designs, by Messrs. Medland and Son and Mr. J. Fletcher Trew, both of Gloucester, are clearly illustrated by their perspective views and principal plans, so that no further description seems necessary. The problem was rendered somewhat unusual by the nature of the site, and the three plans are interesting for comparison, as showing how the several competitors proposed its solution. Mr. Hunt is now proceeding with the contract drawings.

CROSCOMBE CHURCH, NEAR WELLS, SOMERSET.

The screen illustrated in these drawings, which were successful in gaining the Architectural Association Studentship this year, are probably, with the pulpit, about the best examples of English Jacobean woodwork in existence. (We hope at an early day to give the details of the pulpit.) They were mainly the gift of the Fortescues, wealthy mill-owners in the parish, in the days when Croscombe was a place of greater importance than it is now. The Fortescue arms are to be seen on the scutcheon in one of the panels of the chancel screen. The pulpit, which is dated 1616, is manifestly of the same date as the screens. On it are graven the arms of Bishop Lake, Bishop of Bath and Wells from 1616—1626. The general effect of the pulpit is much heightened by the greater part of the body being richly coloured. Though these screens and pulpit are the most striking features in the church, yet even without them the church, with its beautiful spire, its richly-decorated roof, its bench ends, Mediæval and Jacobean, and its fine brass candelabra, teems with interest and instruction to the architectural student; and situated as it is in one of the most lovely valleys of Somersetshire, within two miles of Wells, and in a county full of Mediæval remains, it forms indeed a delightful retreat for the zealous architect. It is much to be regretted that, owing to want of funds, the roof has become so much out of repair that there seems great danger of much of its fine 15th-century wood carving perishing. The architect to the church is Mr. J. D. Sedding. The author of these prize drawings is Mr. Arthur E. Bartlett, of Wimbledon.

A LYCH GATE.

For description see "Practical Architecture," on page 106.

THE SAMARITAN FREE HOSPITAL

The present contract for the Samaritan Free Hospital is for the first portion of the building. The committee have purchased the adjoining houses on each side, and there will be extension of the wings when this property falls in. Provision has been made in the design for this addition. There will be present accommodation for 60 patients, to be hereafter increased to 100. The hospital consists of an extensive light and airy half-basement containing the domestic arrangements, the servants' hall and bedrooms; the ground-floor contains the official portion and sundry wards, whilst the three upper floors embrace patients', nurses', and operating rooms, with every modern appliance for comfort, convenience, and ventilation. There are three lifts, that in centre of hall sufficiently capacious to receive a patient's bed and nurse, and the hand lifts for provisions, &c. The closets, baths, and lavatories are quite apart from main building, with through currents of air. The floors and stairs are absolutely fireproof, and the stories are 13ft. high in the clear. The architects are Messrs. G. Habershon and Fawckner; the builder, Mr. J. Bentley; and the clerk of works, Mr. G. Reed. The first contract is £12,000. The memorial-stone was laid on Wednesday last by the Prince and Princess of Wales.

CHAPEL AND SCHOOLS, DARWEN.

This building has been recently erected for the Trustees of the United Methodist Free Church on the site of the old chapel in Duckworth-street. The basement floor consists of a commodious schoolroom, 64ft. by 56ft., with infants' room and classroom arranged at either end. Over this is the chapel, on the amphitheatre plan, to seat over 650 persons; cloakrooms have been arranged to the entrance of the chapel, and good vestry accommodation, with organ gallery, at the rear.

The work has been carried out by Mr. J. Westwell, builder, of Darwen, at a cost of a little under £4,400, from the plans and under the supervision of Messrs. Hurst and Bolshaw, architects, of Southport.

A new line of railway, connecting Freshwater, Yarmouth, and the western part of the Isle of Wight with Newport, the central town, was opened for public traffic on Saturday. It is contemplated at a later period to carry the line on to Totland Bay.

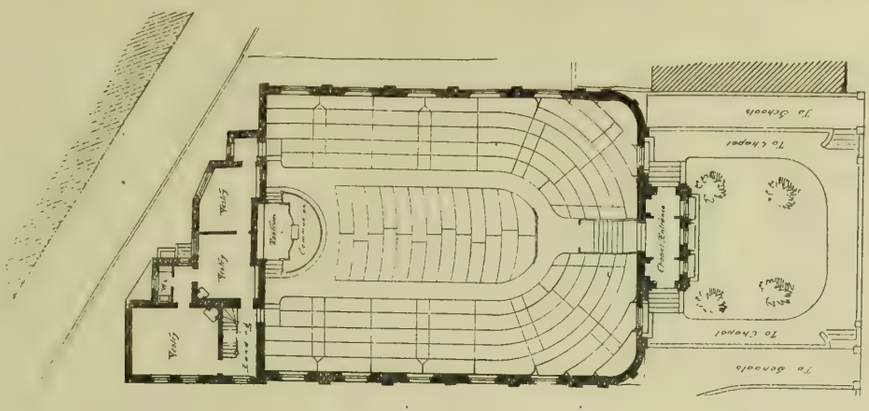
The value has been sworn at £60,054 15s. 6d. of the personal estate of the late Mr. Clement Francis Wedgwood, of Etruria and Barlaston, Staffordshire, manufacturer of earthenware, who died on the 24th of January last.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

The British Archæological Association at Lincoln.—The preparations for the forty-eighth annual congress of this society are now being actively carried out, under the direction of the local committee, of which the Mayor (Mr. W. Watkins) is the chairman, and Mr. W. J. Cant and the Rev. Canon W. W. Fowler, hon. secretaries, aided by the hon. congress secretary, Mr. George R. Wright, F.S.A., of London, who for many years has filled that office for the British Archæological Association, and his honorary assistant, Mr. John Reynolds, of Bristol, the well-known archæologist. On Monday next, July 29th, the Mayor and Corporation will give a welcome to the President (the Earl of Winchilsea and Nottingham) and members and visitors of the Lincoln Congress, at the Assembly Rooms, at 2.15 p.m., and at 2.30 the Mayor and Mayoress, by special invitation, will entertain his lordship and the company generally in the large room attached to the reception-room. On Tuesday, at 11 a.m., the Rev. Precentor Venables will meet the president and the members at the west front of the cathedral, and then proceed to give a lecture on its history. In the afternoon visits will be made to the Roman remains in the city, and an inspection made of the Norman Castle, on which a paper will be read by Mr. George Patrick, of London. In the evening, at the Lecture Theatre of the School of Science and Art, by the courtesy of the committee, the first meeting will take place for the reading and discussion of papers, and no papers can be permitted to occupy more than twenty minutes in their delivery. On Wednesday, July 31st, by the invitation of the noble president, a visit will be made early to Haverholme, his lordship's country seat, where, amongst other objects of antiquarian interest, he will exhibit to those present his famous copy of Camden's "History of Lincoln Cathedral," the only copy known to exist. Afterwards, under the guidance of the Right Rev. the Lord Bishop of Nottingham, Sleaford and other places of interest will be visited. Thursday, the 1st August, will be the Boston day, taking Tattershall Castle and Kirkstead Abbey Chapel on the return to Lincoln. On Friday, August 2nd, it is intended to visit Newark and Southwell. In the evening the city sheriff and Mrs. Whitton will entertain the company at a conversazione in the Assembly Rooms. On Saturday, the official closing day of the congress, it is arranged that a visit early in the morning should be made to Gainsborough, and then by carriages to Stow, for the examination of the old church, said to be founded by Queen Ethelride, and the drive continued to Coates Parish Church, for the inspection of its carved rood-loft and famous brasses. On the return during the afternoon to Lincoln, the closing meeting of the congress will take place, and afterwards a public dinner will be held at the Great Northern Hotel.

The new railway-station erected by the Great Northern Railway Company at Ossett, near Leeds, was opened on Sunday. It is planned on the island principle, with a central platform 150 yards long and 31ft. wide, and covered in by a roof carried on cast-iron columns. There are three blocks of buildings providing booking-office, waiting room, and other accommodation. At the same time the Ossett local board have carried out the formation of a new main thoroughfare 1,000 yards long and 12 yards wide, commencing at the Market-place, and running nearly in a straight line towards South Ossett and Horbury. About 300 yards from the market-place the road is carried over the railway company's premises by a bridge, and from the bridge is to be the new entrance to the passenger station. The road and bridge are now well advanced, and, although not formally opened, are partially in use for traffic. The bridge is 270ft. long, divided into four spans, and formed of iron girders resting upon piers and abutments in solid brickwork.

On Friday memorial stones were laid of a new Baptist chapel, in Church-street, Sudbury. It replaces a smaller chapel on the same site, and is being erected by Messrs. Grimwood and Sons, Sudbury, for £1,457. This is, however, exclusive of hot-water apparatus and other expenses, and the total cost will be £1,900. The style is Gothic of a somewhat Early period, and the plan shows a nave with aisles, transepts, and apse, and galleries on three sides. The chapel will provide accommodation for about 600 worshippers. Mr. W. Eade, Ipswich, is the architect.



U.M.F.C. CHAPEL &c.

DUCKWORTH ST.

DARWEN

HURST & BOLSHAW ARCHTS

SOUTHPORT



THE ARCHITECTS' REGISTRATION BILL.

THE following statement has been issued on behalf of the Royal Institute of British Architects against the second reading of the Bill:—

"1. A Bill to arrange for the Qualification and Registration of Architects, introduced and read a first time in the House of Commons on the 2nd inst., is *not* promoted by the Royal Institute of British Architects, which is the only body of architects acting under the authority of a Royal Charter in the British Empire, but by persons who style themselves 'The Architects' and Engineers' Registration Act Committee,' and whose names (other than those of the chairman and hon. secretary) have not been disclosed to the Council of the Institute.

"2. The Bill professes to be promoted on the ground of the expediency that 'persons requiring aid in architecture should be enabled to distinguish qualified from unqualified practitioners'; but as many surveyors practise architecture in addition to other branches of business connected therewith, this object cannot be attained by merely providing (Section 21) that, after a certain date, no person shall be entitled to use the name of 'architect' unless he be registered. As a matter of fact, the title of 'architect and surveyor' is one ordinarily used by practitioners, and any architect and surveyor, now or hereafter in practice as such, could avoid the proposed registration by simply dropping the word 'architect.' Indeed, should the Bill become law, any person, however incompetent, could still practise architecture in complete disregard of its provisions; and as a large majority of ordinary dwelling-houses in the United Kingdom are not erected under the superintendence of architects, the building speculator or 'jerry builder' could pursue his business, after the passing of the Bill, with the same impunity as before.

"3. The Bill moreover specially exempts surveyors from registration. By Section 27 none but 'registered' architects are to be entitled to recover charges in a court of law for professional services; but this important provision is not to apply to professional members of the Surveyors' Institution. By Section 28, none but 'registered' architects are to be entitled to hold public appointments; but any Fellow or Professional Associate of the Surveyors' Institution who produces a certificate of competency from the Council of that body will be exempt from this restriction. Similar exemptions from the provisions of Sections 27 and 28, before mentioned, are specially framed in favour of members of the Institution of Civil Engineers, although it is well known that many civil engineers practise architecture in addition to engineering. On the other hand, a large number of persons—sanitary and municipal engineers and surveyors, students who have attained the age of 22, and others—who at present are not, and do not pretend to be, architects, will be eligible, under Section 19, to be registered as practitioners of architecture legally qualified.

"4. Under such circumstances the enforced registration only of practitioners and others calling themselves architects could not possibly include a vast number of those who practise, and have long practised, architecture. As a legislative measure, it would be not only incomplete, but delusive.

"5. The Bill provides for the creation of a general council, to consist of 30 persons, and of branch councils, with administrative officers and subordinates, to be appointed in various parts of the United Kingdom. But machinery of the kind already exists. The Council (annually elected) of the Royal Institute of British Architects consists of 34 members, including representatives of allied societies in Bristol, Leicester, Liverpool, Manchester, Newcastle, Nottingham, and Sheffield, with a representative of the principal Students' Association. The Council of the Institute have the strongest motive for maintaining a right standard of professional qualifications, and they can do efficiently at once—and they are doing—much that cannot be done otherwise than efficiently, and at some distant date, by the complex general council proposed to be created by the Bill.

"6. One of the essential objects of the Royal Institute of British Architects, since its establishment in 1834, has been to assist the public in distinguishing between qualified and unqualified persons belonging to the architectural profession, and a supplemental charter, granted in 1887, has afforded additional means to maintain, by an efficient system of examinations and by the moral test of a professional obligation, a body of duly qualified and honourable practitioners. The professional members of the Institute are divided into two classes, termed respectively Fellows and Associates.

"7. Since the year 1882 no person has been admitted to the class of Associates without first passing a qualifying examination; and, while the use of the affixes F.R.I.B.A. and A.R.I.B.A. has been authorised and confirmed, powers have been conferred on the Institute to grant, besides a certificate of membership, diplomas and certificates in connection with examinations. A scheme of progressive examinations, about to be carried out in various parts of the United Kingdom, has been established in connection with the obligatory examination for the Associateship, which has been so successful that, during the last two sessions, 157 Associates have been elected, and some 200 persons have been examined for the purpose in London, Liverpool, and Manchester.

"8. If the Bill become law, the good that has been done and is being done by the Royal Institute of British Architects, in creating and maintaining a professional body of architects subject to certain honourable obligations, will be thwarted, nor will any advantage accrue to the public, seeing that by its provisions a vast number of those who practise architecture are either not required to be registered or are specially exempted. The injury, however, that may follow, by giving to incompetent persons the legal qualification of 'architect,' and by allowing every description of architect under the older title of surveyor, or of some other title, to practise architecture with impunity, provided only that he does not style himself 'architect,' is incalculable; and at the same time evident to all who have given the subject due consideration—among whom are many members of Parliament. It is hoped, therefore, that the House of Commons, in the interests of the community at large, will reject the Bill.

"On behalf of the Royal Institute of British Architects:

(Signed)

"Alfred Waterhouse, R.A., President.

"Aston Webb, Hon. Secretary.

"(Signed) William H. White, Secretary."

Thursday, 11th July, 1889.

[It is perhaps hardly worth while commenting on the above document. We may say briefly that the first paragraph bears testimony to the ostrich-like power of vision of the Institute Council and its officials; that it is amusing to find that whereas the R.I.B.A. last year objected to the Bill because it proposed to register engineers and surveyors, it now objects because it is *not* proposed to do so; and that, without stopping to answer the other childish objections raised, it would be interesting to know on whose authority the statement of objections has been put forward. If simply on that of the official clique, who do as they please during the recess safe from the criticism or objection of their own members, there is nothing to be said or done. We know that the letters that appear elsewhere in this issue fairly represent the opinion of an influential section of the Institute itself, and we strongly advise such members to let Mr. Gough have a little rest, and seize the chance, which we believe will present itself next year, of running a Registration Council. A little wholesome agitation would, we are sure, be successful, and the Institute might then pass the Bill itself next year. It will do so sooner or later, probably, and claim all the credit of it.]

SUFFOLK INSTITUTE OF ARCHÆOLOGY.

THE annual excursion of the Suffolk Institute of Archæology took place on Thursday week, when a well-arranged programme for the visitation of a number of churches in the south-west portion of the county attracted a considerable number of members.

Having made Stowmarket the general rendezvous, the party embarked in seven or eight conveyances, and made for Buxhall. Half-an-hour's ride brought the whole party to the church, where they were received by the Rector (Rev. H. Hill). The church is not a large one, consisting only of nave and chancel. The Rector, who imparted to the company assembled in the church some general account of its principal features of interest, was unable to classify it under the head of Early English, Decorated, or Perpendicular, but the Decorated style appeared to prevail. He described the church as an edifice of massive simplicity, and complained of a less complimentary description given by an archæological visitor on a former occasion. The tower, 20 feet square and 95 feet high, is certainly a noble piece of architecture, but the nave interior is somewhat plain. A very fine double piscina and sedilia were amongst the principal features of interest in the church. Twenty minutes was agreeably spent in the church, after which a short drive brought the whole party to Rattlesden.

At Rattlesden (Rector, Rev. J. Barney, M.A.) the church called for more attention. Approaching it the excellence of its proportions is somewhat spoilt by the dumpy spire, which can hardly be said to be an ornament to the tower. The church is situated on an eminence which makes it conspicuous, and the erection of a fine tower would make it one of the finest in the district. Where, however, £3,000 has already been spent in restoration, such a great work it can hardly be expected will be undertaken yet awhile. The church consists of nave, aisle, and chancel, and is built chiefly in the Decorated and Perpendicular styles. Particulars with regard to it were read by the Rev. F. Haslewood from notes by the Rector. Comments were made upon the fact that the church's patron saint was St. Nicholas, who being the especial patron of nautical men, seldom figures in the title of an inland church. It is supposed that this is to be accounted for by the fact that the insignificant stream which still flows through the village is a relict of former greatness; clear indications existing that at one time it was navigable up to this point. The church contains a fine chancel arch and stained glass east window. The double hammer-beam oak roof, which has undergone restoration during the past decade, has a history of its own. The visitations of the iconoclast Dowsing wrought terrible destruction in the time of the Puritans. The ends of the hammer-beams were formerly adorned with carvings of angels with wings outspread. These were all knocked off, but fortunately some were left so far intact as to furnish patterns for restoration. There are now 33 angels duly installed in the places from which the former images were ruthlessly taken, and these harmonise well with the restored oak work. The pulpit is one of the best examples of Jacobean work to be found anywhere; and it is to the restoration of 1883 that its present beauty is attributable, for no fewer than twenty coats of paint had to be removed to leave the handsome woodwork of the pulpit in its original condition. The arcades and the clerestory windows are fine, and the whole interior of the church is impressive.

Gedding was the next place visited. The Church of St. Mary, which has been restored by Mr. E. F. Bisshopp within the last four or five years, was the first building to attract the notice of the party. In the absence of the Rector (Rev. J. S. Boucher), Rev. R. C. Temple, of Thorpe Morieux, gave some interesting details in connection with the church, the principal of which referred to the discovery in the course of restoration of two Norman windows, and the chancel arch, a remarkably fine one, with three spans. After a short stay the party passed on to Gedding Hall. The greater part of the original mansion, which was the residence of Sir John de Gedding, knight of the shire, has by this time disappeared, with the exception of the porter's lodge, which, with some additions, forms a tolerably spacious farmhouse. The moat has been partially filled by the present occupant, but the greater part of it remains intact and full of water. The course taken in making a dry land communication was not an unwise one. The front door of the house is approached by an old bridge, whose capacity is not equal to bearing the weight of two persons near the same place. The house, groaning with the weight of age, contains many features of interest, amongst the most noteworthy being a staircase leading direct from the kitchen down to the moat.

Having taken farewell of Gedding Hall the party, gazed at by the villagers, pursued their journey to Thorpe Morieux. A short halt was made at the Rectory, where refreshments were provided. Attention was first attracted by the antique little porch of church and the carving on the entrance door, and the eye was immediately afterwards struck by the font. A semi-globular basin is let into a square stone block supported on four pillars. This interesting struc-

ture is of Early English architecture, though the nave of the church belongs to the Decorated and the tower to the Perpendicular period. The chancel, which is exceptionally long, bears on its north and south walls two grand marble tablets—one of these surmounted with a coat-of-arms and most beautifully preserved, is in memory of Rev. John Fiske, who died in 1764, and whose wife was descended from George, Duke of Clarence, and the other of his daughter. The font appears to have been removed from the chancel to its present position, and the unusual length of the chancel led the Rector to the supposition that what was now the chancel formerly constituted the whole church.

On leaving Thorpe Morieux the party proceeded to Lavenham, where a substantial repast was partaken of at the Black Lion Hotel, and at the close of the dinner a little formal business was transacted. Lord Henniker, who apologised for inability to attend, was, on the motion of Mr. H. C. Casley, seconded by Mr. B. P. Grimsey, unanimously re-elected president. By an equally unanimous vote Rev. F. Haslewood was re-elected hon. secretary, and the Council was also re-appointed. The following new members were elected:—Mr. H. W. Ram, Castle-terrace, Orford; Mr. R. E. Bunn, 9, Friar's-road, Ipswich; Rev. L. Mercer, M.A., Hawstead; Mr. F. Pawsey, Ipswich; Rev. E. Hill, Mr. C. H. Nunn, Bury St. Edmund's; and Rev. A. H. Hayes.

After the dinner the party proceeded to view the grand Perpendicular church, which holds the premier place amongst the churches of Suffolk for the massive beauty of its structure. The tower, which is 140 feet high, is too familiar to all who pass by that part of the country to need description, whilst the church itself has been so often described in full that it is needless to repeat. One interesting incident was mentioned in the course of a few remarks by the Rector (Rev. J. M. Croker). In removing a slab of stone a very old coffin was discovered in almost as perfect condition as if made yesterday. The slab was let down again for the time, and taken up the next day, and not a vestige remained of the coffin or its contents save a handful of mould. Another interesting feature of Lavenham is the venerable Guildhall, now in extreme old age. A movement has been set on foot for its restoration, and in a competition a design by Mr. John S. Corder was accepted.

Mr. Corder read an interesting paper upon this building. After a few prefatory remarks concerning the origin of trades guilds, Mr. Corder observed that in the fifteenth and sixteenth centuries Lavenham was a place of great mercantile importance, being a great centre of the wool trade, the manufacture of serges amd other woollen blue cloths being extensively carried on. The town was under the immediate protection of the De Veres, Earls of Oxford, who held the lordship of the town from the reign of Henry II. till that of Elizabeth, when Edward, the seventeenth earl, who was a noted spendthrift, sold it to Paul D'Ewes, father of the antiquary, Sir Simon D'Ewes. The first of the line, Aubery de Vere, married, it was said, a half-sister of William the Conqueror, Beatrix de Guisnes, and it was recorded of the family that they founded the Priory of Earl's Colne. The third DeVere became Earl of Oxford, and an unbroken line of twenty earls carried the pedigree down to 1704, when the estates fell into the hands of an heiress, who died without issue. The family, which made Castle Hedingham their principal residence, had also a residence in Lavenham, called the Manor House, the foundation of which might still be seen peeping out in the meadow in front of Lavenham Hall, and doubtless, the present house formed at one time part of the original mansion. In the town where three guilds, the guild of St. Peter, granted by John, the 16th earl, having its hall in High-street; Holy Trinity, granted by the same earl, with its hall in Prentice-street, and the guild of Corpus Christi, granted by John, the 15th earl, in 1529, having its hall in the Market-place. This, which was the first erected, was the building now surviving. John died in 1539, leaving four sons and four daughters, and was buried in the chancel of Hedingham Church. Mr. Corder exhibited a beautifully executed set of drawings of this monument, the tomb showing sculptures of the Earl and his wife, with the four girls on one side and the four boys on the other. Proceeding with his remarks, Mr. Corder said the hall of the Corpus Christi was a beautiful example of the timber-framed buildings of the 15th century. Constructed mainly of oak, it gave, injured and mutilated as it was by the wear and tear of 3½ centuries, a good idea of the appearance and construction of buildings of the Middle Ages. Its frontage was 48 ft. to the Market-place and 27ft. to Lady-street. Probably in former times adjacent buildings were connected with it. The structure of the building was minutely described. Of the windows, all of which were originally bays, only one remained, that on the ground-floor to Lady-street, and a very beautiful one it was. Of this window Mr. Corder showed a correct drawing, as also of the elaborately carved corner post, which showed a small full-length effigy of the founder in plate armour. The right hand grasped a distaff on which was wound some unspun yarn, and his left held the scroll or charter of the guild. Entering by the beautiful porch, planted at each corner by two angle posts of similar design to the one above mentioned, but having beneath the canopies in place of effigies two lions sejant rampant guarding the entrance, one entered the main hall, 20 feet by 17 feet, on elaborately moulded beams and joists overhead. It was here that the merchants met and transacted business. Other rooms were described, and Mr. Corder observed that the rear portion had been considerably altered. The staircase from the main hall was formed of solid baulks of wood sawn through diagonally, and resting on bearers. The doorways were all Tudor headed, those on the ground-floor having carved spandrels. The front door was probably one large door with a smaller door cut in the centre. The windows were glazed with glass in lead lights, and in the upper lights rich blazonings and coats of arms were, doubtless, inserted. The cellar was a most interesting apartment about 16ft. by 31ft. 9in., lighted by three small windows and recessed. In this cellar it was recorded that Dr. Tayler was confined when on his way to his place of martyrdom on Aldham Common, in 1515, and till lately an old post existed to which it was said he was chained. After the guild was abolished the building passed successively through stages of Town Hall, Bridewell, and Workhouse; it was then turned into cottages, finally into a granary and wool store, and there was no telling where it would have been by this time had not Mr. Cuthbert Quilter rescued it from further degradation, and it was regretable that more local spirit was not infused into the scheme for the preservation of this, one of the finest buildings in Suffolk.

A visit to Brettenham Church, where the party were received by Rev. J. C. Betham, brought the excursion to a close, the party returning by vehicle to Stowmarket station.

THE BOROUGH-SURVEYORSHIP OF STRATFORD-ON-AVON.

ON the 18th inst. a special meeting of the Town Council was held for the purpose of appointing a borough surveyor in succession to Mr. Alfred T. Davis, who has recently received the appointment of county surveyor of Shropshire. In response to an advertisement, ninety-nine applications had been received. The salary is £200 per annum. The candidates were eventually reduced to three, who were interviewed by the General Purposes Committee, who now recommended that Mr. Adam Horsburgh Campbell, assistant to the borough engineer of Edinburgh, should be appointed. The Mayor moved the adoption of the report. Alderman Bird seconded this. Mr. Lunn moved, as an amendment, that the appointment be offered to Mr. T. T. Allen, a member of the Council. For nearly an hour Mr. Lunn spoke in favour of Mr. Allen, referring to his twenty years' service as surveyor under the late Local Board of Health, and to the circumstances which prevented his continuing the appointment after that body was merged into the Corporation in 1880, consequent upon the extension of the borough boundaries. Mr. Lunn contended that Mr. Allen was not fairly treated on that occasion, and that, having lost his appointment by the passing of the local Act, he was entitled to a superannuation allowance of £80 per annum, which he had not claimed. As an act of justice, he wished to see Mr. Allen reinstated in the office, feeling sure that he would discharge the duties satisfactorily to the town. In reply to the Mayor, the Town Clerk stated that before Mr. Allen could be appointed he would have to resign his seat as town councillor. Mr. Lunn replied that if the appointment were offered to Mr. Allen he would afterwards resign his seat. Alderman Bird protested against any act of this kind. Mr. Allen had offered to do the work for £180 per annum after the Council had advertised the appointment at £200. What would those ninety-nine gentlemen who had been induced to apply for the post at £200 per annum think of the Stratford Corporation if they appointed a member of their own body at £20 less, and what would every corporation in England think of such an Act? It would be described as highly dishonourable on their part. Mr. Smallwood seconded Mr. Lunn's amendment, and urged the Corporation to give the appointment to Mr. Allen, who, although he was fifty-nine years of age, was to be preferred to younger and inexperienced men. Mr. Pearce said that Mr. Allen was a better man than any of the other candidates. Alderman Gibbs: "You are not competent to judge." Mr. Pearce (warmly): "If I am to be subjected to interruptions of this kind, I'll wash my hands of the Town Council." ("Oh," and laughter.) The debate was continued by Aldermen Newton and Eaves, and Messrs. Greenway, Thompson, Greene, and others, and eventually, on the motion being put, the committee's report recommending the appointment of Mr. Campbell was carried by 12 votes to 5.

TERRACOTTA LUMBER.

A NEW product is being manufactured in Victoria under the title of "terracotta lumber," and appears to be a compound of clay and sawdust. A paper descriptive of its qualities and making was read before the Victorian Institute of Architects at a recent meeting by Mr. E. B. Harper, the manager of a company which is bringing it out, from which we learn that the principles involved in its manufacture are to so plentifully mix such granular combustive particles as sawdust with clay, that without other fuel sufficient heat is engendered to burn the surrounding clay, and so intimately that when the sawdust vacates the compound by combustion under the firing process the clay residue, now turned into brick, is so thoroughly honeycombed with air cells and spaces first occupied by the sawdust, that it may be economically wrought into form with carpenter's edged tools, and nailed and screwed to place, with the same facility that timber is nailed and screwed. The advantages claimed for the material for building purposes are lightness, cheapness, imperviousness to the attacks of age, fire, frosts, vermin, acids, and gases; non-conducting properties of heat, cold and sound, the power of molecular attraction exerted by the cellular surfaces, anchoring mortars and cements so deeply as to defy detachment, thus combining in one material several qualifications for fire-proofing and building. The material, when impregnated with asphaltum, becomes waterproof, while it is claimed that the exposed surface of a building can be made waterproof after erection, and that for interior work it may be manufactured with a glazed surface. The weight of the material is 60lb. to the cubic foot, or about half that of the bricks. A recent test was afforded to architects of the strength of an arch 6ft. span and 10in. deep by loading 4,545lb. of pig iron on a single square foot of surface. A 12in. flat arch has sustained a weight ten or twelve times greater than actually required. The average weight under which nine samples of the lumber were crushed was 840lb. to the square inch. The cost is said to compete with that of common bricks.

THE PARTY-WALL QUESTION AT COVENTRY.

THE action of the Coventry sanitary authorities with regard to the thickness of party walls in tenementary property is still being watched by those interested in the building trade. At the meeting of the Board of Guardians (who have control of the rural district) on Wednesday, Mr. Goate was expected to bring on a motion relating to the Board's recent decision to insist upon all party or division walls being not less than 9in. in thickness. Upon rising, Mr. Goate said one reason he had for bringing under the notice of the Board the action of this by-law was that——

The Chairman (interrupting): Do I understand your notice is to rescind the resolution?

Mr. Goater: Yes; but I am not proposing to do that this morning. He went on to explain that his reason for giving the notice was that their by-laws should be the same as the urban

sanitary authority. At the present time the urban authority was considering the whole of their by-laws, and he did not think the board should attempt to alter theirs until the urban authority had decided what they would do; therefore, he asked for a postponement of the motion he had to make.

The Chairman: I do not think it should affect us what the city council does. If they do things that are unwise, it is no reason why we should do so.

Mr. Loudon agreed that it was not desirable to discuss in public what another local public body were considering in committee. Referring to the plans that had been lately refused by them because they were not in accordance with the by-law demanding 4½in. walls, he thought they hardly did right in doing so if they were right in every other particular. They had only just discovered they had been passing plans not in accordance with their by-laws, and as so many had been passed, he did not think that particular one should suffer which came before them before the resolution was passed.

Mr. Robinson did not think the Board were ever any party to the plans being passed. Their surveyor certified they were in accordance with the by-laws, and it was because of his statement they had done so. He thought the plan in question had been amended and passed.

None of the members were quite certain as to this, and it was decided to inquire of the surveyor. The motion of Mr. Goate was allowed to stand over for a fortnight, during which period it is expected that the City Council will discuss and decide the matter so far as the urban district is concerned.

A SCHOOL OF HANDICRAFT.

A CORRESPONDENT writes:—"Those who visited the Exhibitions of Arts and Crafts both in London and Liverpool last year may have noticed some very remarkable productions in wood and metal from the Guild and School of Handicraft in connection with Toynbee Hall. The report of two years' work has just been issued. The leader and honorary director of the school is Mr. C. R. Ashbee, one of the Toynbee residents and a practising architect. The methods employed there seem to be excellent, and to approach both in spirit and practice the old workshop system, where personal interest was thrown into the work, and adequate supervision from capable leaders led to the production of sound and artistic work. The number attending the school has been kept small so that this personal touch might be thoroughly maintained. There are more applications for entrance than the school will accommodate, so that a careful selection has had to be made. During the daytime the school is occupied as a workshop in the usual way of business, but those using it are expected to assist in the tuition of such pupils as can only attend in the evening. Classes in artistic work subjects are held in the workshop itself. There is therefore no divorce of theory and practice, and that indefinable thing called the artistic spirit is kept up, cultivated, and really utilised in the work sent forth. Some of the Eastern-like copper dishes sent out are original in design and remarkably fine and spirited, not at all like the more commercial or, still worse, amateurish things so plentiful in the market. Culture and craftsmanship are evident in the work itself, which again does not suffer from being either overpretty or amateurish. The school has been helped during the spring of this year by practical addresses from eminent craftsmen and scholars. Mr. William Morris gave an address on Gothic architecture, Mr. W. B. Richmond on the dignity of handicraft, Sir James Linton and others have spoken on their special subjects. This educational experiment seems to be an excellent way of keeping alive what is real and true in art workmanship, and inspiring in those who are not craftsmen an appreciation of good work when combined with fine design. On a small scale they have done what a technical school cannot hope to achieve; they have produced pieces of work some of which will compare with the products of any country or time in the same departments of effort. The school has also proved, what some of us never doubted, that there is a great deal of fine native talent which only waits opportunity and congenial environment to serve the double end of doing good work and of giving intense pleasure to the workman in the doing of it."

Engineering Notes.

THE NEW BARRY DOCK.—Last week the new Barry Dock was opened. The docks and railways, which have been built at a cost of £2,000,000 to meet the growing needs of freighters of South Wales coal, are situated on the north shore of the Bristol Channel, about seven miles west of Cardiff and 31 miles east of Swansea. The site selected for the dock is the eastern portion of the channel between the island of Barry and the mainland, this channel being about a quarter of a mile wide. The entrance to the docks is at the eastern end of this channel, and is protected by breakwaters, one of which, the eastern, is 2,600ft. and the other, the western, 700ft. in length. The waterway between the breakwater heads is 350ft. The outer entrance of the dock is 80ft. wide, and gives access to a basin 500ft. wide by 600ft. long, having an area of seven acres. The basin is surrounded by vertical masonry walls of varying sections. Between this basin and the dock is the inner entrance or passage, also 80ft. wide, this passage being crossed by a rolling bridge for road or rail traffic and worked by hydraulic power. The gates at the entrance and passage are 48ft high and 48ft. long from heel post to mitre post. The dock proper is 3,100ft. in length, and the *maximum* width is 1,100ft., divided at the western end by a mole with two arms, one 1,500ft. long and about 500ft. wide, the other 1,200ft. long and 300ft. wide. The water area of the dock is 70 acres, measured to a line on the sloping sides below which would be 26ft. of water at high water of neap tides. At the north-east corner of the dock is a timber dock. On the north side of the dock there will be 11 fixed coal tips; there will also be four fixed coal tips on the north side of the mole, one at the end of the mole, and one at the west end of the dock. These 17 tips are capable of tipping 4,000,000 tons of coal per annum. The whole of the dock is lighted by eleetricity, and the work of the dock machinery will be mostly carried on by hydraulic power. The cost of the dock and surroundings has been somewhat above £850,000, including breakwaters, docks, and machinery. The total with railways is £2,000,000. The construction of the dock has already caused about 10,000 people to settle in the neighbourhood, and within the last three years no less than ten chapels have been built there.

COMPETITIONS.

BECKENHAM, KENT.—The instructions in the competition for Arthur-road schools were: Accommodation for 800 children, to be arranged for future enlargement to 1,200 children, with caretaker's residence, &c.; all to be on the ground-floor. The instructions relative to the competition were approved by the assessor, Mr. E. R. Robson, who has now examined all the competition plans, and recommended the Board to adopt those prepared by Mr. John Ladds, of 4, Chapel-street, Bedford-row. The Board have since seen him, and given instructions to complete the same and specification without delay.

CONGLETON.—The corporation of this borough recently invited schemes in competition for the heating and ventilation of their Town Hall, one of the late E. W. Godwin's works, and the first premium was awarded to William Sugden and Son, Leek. These works are now about to be carried out under their direction; also the insertion of new promenade balconies and capacious end gallery (supported by carved and moulded teak posts) in place of the present highly-elevated gangways; concrete and wood-block flooring to the whole of the large assembly room, and other alterations and additions are also decided upon.

NEWCASTLE-ON-TYNE.—The Corporation of Newcastle-on-Tyne have, on the recommendation of their assessor, Mr. Murgatroyd, of Manchester, selected the design of Messrs. Quilter and Wheelhouse, of 10, Brunswick-square, London, for the proposed new police and fire brigade stations at Elswick-lane. The second premium was awarded, we hear, to Messrs. Clark and Moscrop, of Darlington; and the third to Mr. A. B. Gibson, of Newcastle-on-Tyne. There were a large number of competitors.

PALACE OF JUSTICE AT LISBON.—We have received the following news from Lisbon:—The four designs finally to be judged bear the mottoes: "Deus protege os fracas," Portuguese; "Aljubarrota," English; "Pro Patria," supposed to be Belgium; "Justica," Portuguese. Owing to the judges not coming to a decision, others have been appointed, hence the delay in awarding the premiums. The Bristol *Daily Press* of Tuesday says:—The Portuguese papers announce that the four designs bearing the following mottoes: "Deus protege os fracas," "Aljubarrota," "Pro Patria," and "Justica," are still under consideration, the judges having disagreed as the best design of the first two mentioned. The Government have appointed other judges in their place to decide. We stated some time since that one of these designs was by Mr. J. C. Moncrieff, F.R.I.B.A., of this city, the other designs being one Belgian and two Portuguese. Over 500 competitors of all nations entered.

SHEFFIELD.—At its last meeting the Sheffield School Board had under consideration the committee's statement that it had considered the report of Mr. E. R. Robson upon sets of plans submitted in competition for the schools proposed to be erected at Neepsend and Carlisle-street, and recommended that the plans marked "Hallamshire" should be adopted for Neepsend, and the plans marked "Light and Air" for Carlisle-street. The envelopes were opened, and it was found that "Hallamshire" was Mr. J. B. Mitchell-Withers, and "Light and Air" Messrs H. Hodgson and J. E. Benson, of Bank-street. In the first school, the award of £15 to unsuccessful competitors went to Messrs. Hodgson and Benson for a second set of plans, and of £10 to Messrs. Wightman and Wightman. The plans placed second and third in the Carlisle-street competition were both by Mr. C. J. Innocent, so the third prize went to Messrs. Wightman and Wightman, who sent in under the signature of "The Don." Mr. Robson in his report said:—"I am bound to say I have never had competitions for board schools which have occupied so much time in the actual investigation. This has arisen from the singular merit of the majority of the plans. In most cases the report turns on the question, 'Which plan is least objectionable?' In the present cases it has been exactly the contrary. I think the architects of Sheffield are to be congratulated on the distinct advances made in their knowledge of the subject. But for the fact that some competitors have had to be excluded on technical grounds, I think it would have been even more difficult to arrive at a conclusion as to which plans were best. I am particularly sorry in the competition for Neepsend that 'The Don' (Messrs. Wightman) had to be so excluded, and am equally sorry in that for Carlisle-street that 'Hallamshire' (Mr. Mitchell-Withers) has met the same fate, for both these sets of plans and designs are evidently the result of skill, pains, and knowledge."

SWANSEA.—The town council received 21 designs for the new market in Oxford-street, and, after taking counsel of the borough surveyor, have reserved the five bearing the mottoes "Prosperity," "Prudentia et Candore," "Floreat Swansea," "Plenty," and "The Earth is the Lord's and the Fulness Thereof" for further consideration. The first three of these are, we hear, by local architects. At the last meeting of the council it was decided, after much discussion, that the designs be referred to a specialist in market buildings, to be nominated by the President of the Royal Institute of British Architects. It was suggested by a committee that the fee to be offered to the assessor be 25 guineas. The estimated outlay is £17,000.

Two stained-glass windows have been recently introduced into the parish church of Detling, Kent. The windows have been provided by Messrs. Heaton, Butler, and Bayne, of Garrick-street, Covent-garden; one, in the chancel, represents in its three lights the "Annunciation," the "Presentation in the Temple," and "The Child Jesus in His home at Nazareth," and is a memorial offering from the vicar and his children. The other, in the west window of the tower, contains in its three lights figures of Faith, Hope, and Charity. Messrs. J. Wood and Sons, of Broughton Monchelsea, carried out the stonework.

A mission room, in connection with the church o St. Mary, Great Sankey, near Warrington, has jus been erected at Penketh, an adjoining village. I has been built by Messrs. Collin and Son, Warrington, from designs by Mr. W. Owen, architect, als of Warrington, and the total cost has been abou £2,000.

Building Intelligence.

Arbroath, N.B.—The water-tower just built is situated on the highest peak of a range of sand-hills which overlook the town, and takes the place of an old tank situated at the pumping-station. The foundations had to be carefully designed and carried out, owing to the loose nature of the soil. The first thing done was the surrounding of the hill with a retaining ring of concrete 13ft. wide and about 2ft. thick, and on the top of this was raised the stone retaining wall. The foundations for the main building were now cut out and filled in with concrete 2ft. 6in. thick and 16ft. broad; on this concrete the walls were carried up with large flat stones 9in. thick and 3ft. square till a thickness of 6ft. was reached at the level of the promenade. The hill was left as nearly intact as possible, and to show that the work has been well done, there has not been the slightest depression, nor has a crack or flaw been seen in the whole building, although the weight is over 8,000 tons when the tanks are full of water. The building is of rock-faced courses 12in. deep, and the dressings are scabbled; the two staircases in the towers lead to the tanks and the roofs. The colour of the stone is red. The tanks are made of ⅞in., ¾in., and ½in. cast iron, with flanges and packing space; iron gussets the whole depth of the tanks support the insides, with iron tie-rods to keep the sides rigid. The old tank at the pumping-station was taken down and fixed up in the centre block, while two new tanks occupy the end blocks. The roofs over the tanks are of wrought iron, covered with flooring and zinc, white-painted, and ventilated with screw ventilators. The mason work was carried out by Mr. Archibald Anderson at a cost of £3,500; the joiner work by Mr. Christie at £180, and the iron work by Messrs. Geo. Anderson and Co., Arbroath Foundry, at a cost of over £2,000, and the plumber work by Mr. McAndrew, Carnoustie, at over £200. The works have been very efficiently carried out under the superintendence of Mr. John Allan, clerks of works, and the designs for the work were prepared by Mr. Wm. Gillespie Lamond, architect and civil engineer, Stirling Cottage, Friockheim, Arbroath.

Birmingham. — The important district of Bloomsbury in this city has long felt the need of increased house accommodation. It is a densely-populated neighbourhood, and in its vicinity are several large carriage, metal, rope, and other works, employing a great number of hands. To meet to some extent the above-mentioned want, about 100 houses are now being erected, and also several well-arranged corner shops. These houses will front three important roads. Each house will consist of parlour, sitting-room, three bedrooms, cellar, scullery, and necessary out-buildings, and be fitted up with the w.c. arrangement. The front elevation will be of a somewhat attractive character and Gothic in style, ornamental stone, wood, glass, and brickwork, Minton's tiles, ornamental ironwork, &c., being introduced. The architect is Mr. J. Statham Davis, of Birmingham.

Harrogate.—Prince Albert Victor last week opened the new buildings of the Bath Hospital, Harrogate. The institution has been in existence more than half a century. The new department has been added through the generosity of Miss Rawson, of Nydd Hall, whose name the home will bear. The new buildings have been constructed from designs by Messrs. Worthington and Elgood, Manchester, at a cost of about £30,000. The 4¼ acres given as a site are on the shoulder of some rising ground on the south-west side of the town. The uneven character of the ground seemed at first to present serious difficulties; but the architects have succeeded in making it a conspicuous merit. Built on various levels, the structure has a picturesque effect it would have been difficult to get otherwise. Neither outside nor inside is there much suggestion of a hospital. The two departments are kept distinct. The hospital is one side and the convalescent home on the other. There is a difference of 6ft. in the level of the two blocks, and they are further separated by the administrative department, which is lodged between. The hospital has accommodation for 40 males and 35 females, and the convalescent home for 30 males and a rather less number of females.

Hunslet, Leeds.—On Saturday afternoon the Countess of Harewood laid the foundation-stone of a new Sunday-school and parochial institute, which is being built according to the designs of Messrs. Perkin and Bulmer, architects, in connection with St. Cuthbert's Church, Hunslet. The building is being erected at the corner of Kirkland-street and Beeston-road, and in a line with the Kirkland-street elevation of the church, with which it harmonises in architectural style, and also in materials, being of red brick with stone dressings, and covered with green Westmoreland slates; the windows glazed with clear sheet in leads. The accommodation provided is a parochial room, 74ft. by 30ft., lighted with clerestory windows over the class-rooms, and large windows at each end. It has an open wood roof, with arrangements for the support of gymnastic appliances, and a platform at the east end accessible from the reading-room behind, and retiring-rooms at each side. On the south side are five classrooms, one 24ft. 6in. by 14ft., three 14ft. by 12ft., and one 10ft. by 12ft. At the east end is a parish-room, 16ft. by 14ft., and a reading-room, 20ft. by 13ft., at each side of a special entrance, having lavatory accommodation attached. There is also a sewing-room, with entrance to the parochial-room, and another to the street for entry of goods. It is connected with a kitchen in the basement, and cellarage for hot-water apparatus.

Incorporated Church Building Society.—At the annual meeting of this society grants of money were made in aid of the following objects—viz.:—Building St. Michael's Church, Langley-green, near Birmingham, £150; rebuilding the churches at Beelsby, St. Andrew's, near Great Grimsby, £30; Epping, St. John the Baptist, Essex, £100; and Toft, SS. Peter and Paul, near Market Rasen, £20; and towards enlarging or otherwise improving the accommodation in the churches at Aldingbourne, St. Mary's, near Chichester, £15; Cudham, SS. Peter and Paul, near Orpington, Kent, £30; Horfield, Holy Trinity, near Bristol, £80; Hyson-green, St. Paul's, near Nottingham, £60; and Pontnewydd, Holy Trinity, near Newport, Monmouth, £40. Grants were also made from the Mission Buildings Fund towards building mission churches at Bridgehampton, Yeovilton, near Ilchester, £10; and St. Alban's, Romford, Essex, £50. The following grants were also paid for works completed:—Burton Dassett, All Saints', £40; Swansea, St. Gabriel, £300; Criccieth, £80; High Wycombe, All Saints', £25; Henshaw, All Hallows, near Bardon Mill-on-Tyne, £80; Penboyr, near Llandyssul, £20; Tooting Graveney, St. Nicholas, £70; Burmantofts, St. Agnes, near Leeds, £50; Wychling, Kent, £20; Sheldwich, Kent, £35; Nelson St. John, near Treharris, £100; Stoney Stanton, near Hinckley, £20; Chilton Polden, St. Edward, near Bridgwater, £40; Sutcombe, Devon, £50; St. Dunstan's-by-the-Forge, Derby, £40; Ore, Christ Church, Hastings, £30; and Seaton, The Good Shepherd, Devon, £20.

Penketh.—St. Mary's Church School, Penketh, was opened on Wednesday week. The new buildings, which have been erected at a cost of nearly £2,000, from designs by Mr. William Owen, F.R.I.B.A., of Warrington, consist of a schoolroom, capable of seating from 250 to 300 people when used for service, with a chancel and children's vestry, used also as choir vestry and vestry for clergy. The schoolroom is divided into nave and side aisles. The chancel, which is sufficiently extensive to accommodate choir stalls and afford ample Communion space, is divided from the nave by a traceried screen and a pair of wrought-iron folding gates in the centre. On the inside of this screen will be a curtain, which will be drawn to shut off the nave or schoolroom when used for any purpose other than that of religious worship. The building is heated by high-pressure pipes fixed by Messrs. Musgrave and Co., of Belfast. Externally the building is of grey bricks, with red Ruabon terracotta dressings, and the windows, which are traceried throughout, and, in the case of the east and west windows, of considerable size, are also of red terracotta work. The work of building has been carried out by Messrs. Collin and Son, Warrington. The reredos is of oak, by Messrs. Jones and Willis, Liverpool; the choir stalls and chancel screen are of pitch-pine, worked from the architect's drawings by the builders. All the brass and ironwork is by Messrs. Jones and Willis.

Poplar.—The Duchess of Albany recently laid the foundation stone of the new Church of St. Frideswide, which is about to be erected in Follett-street, Poplar, in connection with the Christ Church (Oxford) Mission to the East-end poor of London. The church is designed in the Early English style, having lancet windows on the two sides, and wheel windows at the east and west ends, a special feature being made of that at the west end, owing to provision for extension westward by means of a narthex. The material externally is of red brick, with stone sparingly introduced. The interior is of yellow brick-work, with bands of red brick, and the arches of the nave arcade and all window heads are also of this latter material. The church is in one span, the interior width being about 39ft., and the length, including the apsidal chancel, which is under the same roof with the nave, 91ft. There is a north aisle, which is rather irregular in form, as it follows the boundary line of the site. It is utilised as a side chapel for daily services, and the organ is placed in a loft over a part of same. The vestries are at the east end behind the chancel. The cost of the church will be about £5,000, and it will be proceeded with in two sections. The entire church, with the future narthex, will accommodate about 700 persons, of which number the nave and north aisle will seat 525. The design has been prepared by Mr. Robert Willy, F.R.I.B.A., of 66, Ludgate-hill, E.C., and Ealing.

Ribbleton, Preston.—The Church of St. Mary Magdalene at Ribbleton was consecrated on Monday by the Bishop of Manchester. It is being erected at the corner of the High-road and Farington Hall-road, and will be cruciform in plan when completed. At present the nave, transepts, and lower part of the western tower only have been built, leaving the chancel and vestry for future extension. The walls are built externally of Yorkshire stone parpoints, with red Rainhill stone for all window and door dressings, copings, weatherings, &c., this latter stone being also used for all the internal windows, piers, arches, &c., and for facing the walls up to the level of the window-sills, the remaining plain wall space being plastered. The roofs are covered with Westmoreland green slates, and finished internally with curved boarded ceiling, divided into panels by moulded ribs. The aisles are paved with Yorkshire grey flagging, and the windows filled with glazing. The internal arches are of stone deeply moulded, the chancel arch springing from moulded shafts, with carved capitals. The nave is lighted by four two-light windows on each side, the tracery in the heads being varied throughout. The transepts have a large circular wheel window of varied design in each gable, and the tower, which opens into the church with a lofty and deeply-moulded arch, is lighted by a large four-light traceried window at the west end. The main entrance to the church is by a large doorway on the south side of the tower, the tower being arranged to serve as a porch and baptistery. The church, when completed, will accommodate about 250 people. The style of the church is Decorated Gothic. Mr. R. Knill Freeman, of Bolton and Manchester, is the architect, and Messrs. G. Wood and Sons, of Bootle, Liverpool, were the contractors.

The London County Council and Bars and Gates.—At Tuesday's meeting of the London County Council the Parliamentary Committee reported, on a reference as to obtaining powers to remove all bars, gates, and other obstructions now existing in the London streets and thoroughfares. A Bill for this purpose would, however, be met with very extensive opposition, and be attended with very heavy costs; whereas if a Bill were framed to deal with a few gates or bars only, the question of compensation and similar questions would probably be decided at a more moderate expense. The committee had accordingly selected four test cases on two different properties—namely, the obstructions in Torrington-place, Gordon-street, Upper Woburn-place, and Regent-place, leading out of Regent-square, and recommended that it be referred to them to take steps for the removal of the bars above-mentioned by a Bill to be introduced next session. The recommendation was agreed to.

St. Alban's Abbey.—Last week the bell "Edmund," which has recently been placed in the north-east tower by the munificence of Lord Grimthorpe, was dedicated, the service being performed by the Ven. Archdeacon Lawrance, in the presence of the cathedral ringers and others. After the service, and the tolling of the bell by conductor, the ringers (in honour of the occasion) ascended to the belfry and attempted a date touch of 1,889 changes, but were unsuccessful in

bringing it round. It is intended that the bell "Edmund" shall be chimed for the daily services, excepting Sundays and festivals; its weight is about 10cwt., and the tone is said to be exceedingly good.

ST. EDMUND BELL.

It was an ancient mariner,
And he stopped one of three:
"Do yer know why that there little bell
Was christened after me?

"He dearly loves his own sweet voice,
And he talketh noisily;
And that is why that little bell
Was christened after me.

"He careth not what people say,
For a brazen front hath he;
And that is why that little bell
Was christened after me.

"The Abbey he will never leave,
But will stick tenaciously;
And that is why that little bell
Was christened after me.

"Then think, Albanians, when you hear
The bell, named after me,
Of all I've done, and all I do,
Which you shall hear and see."
(*Herts Advertiser and St. Alban's Times.*)

YAVERLAND.—Yaverland Church, in the Isle of Wight, has been reopened after restoration. Mr. Christian prepared the plans, and these have been carefully carried out by Messrs. James Ball and Son, the well-known builders of Cowes. The walls have been re-erected, the roof remade open with oak, two vestries added, the accommodation of the church increased by the addition of a north aisle, and the chancel lengthened 7ft. or 8ft. The nave is the same size. The old deal seats have been removed, and comfortable oak seats of modern construction substituted. The pulpit is of carved oak, standing on a stone base. It has a carved dental top with perforated bottom panels. The Communion table is also carved, the centre panel with the lamb and flag, the emblem of St. John the Baptist (to whom the church has been dedicated), and the side panels with flowers. The carving, both of the pulpit and table, was done by Messrs. Ball. The chancel has been paved with Minton's encaustic tiles, also containing the same emblem as the Communion table. The reading desk is of oak, and the lectern is a polished brass eagle. A new organ, costing nearly £400, has been added. The rebuilding of the church (exclusive of the organ and church furniture) has cost about £1,900.

YORK.—The new chapel which has been built in connection with the York Union Workhouse was opened on Friday last. It has been erected from designs by Messrs. W. G. Penty, F.R.I.B.A., and George Benson, A.R.I.B.A., architects, of York, at a total cost, including furnishings, of £850. It will accommodate 500 worshippers, and is 63ft. long by 27ft. wide, with separate entrances for the male and female inmates. The structure is faced with ordinary York clamp bricks, with stone dressings sparingly used. The chapel is ventilated by means of Tobin's inlet tubes, and a large Shorland's extract roof ventilator. The heating is by hot-water apparatus.

CHIPS.

At a meeting on Tuesday of the Gloucester city council a long discussion arose in regard to the appointment of Mr. G. H. Hunt, of London, as architect, to carry out his premiated plans for proposed municipal buildings, when the whole question of erecting the buildings was revived. Ultimately the motion was adopted by 17 to 9 votes.

A monument by Mr. E. Aukland, of Rollcston-street, Warrington, in memory of the late Mr. Warrington Wood, is about to be placed in the cemetery of that town. The monument is of Bolton-wood stone, and stands on three bases. On one of the panels is the following inscription:—"To the beloved memory of John Warrington Wood, sculptor, Professor Academio de San Luca, Rome." Above the inscribed panel is a canopy supported on four polished granite columns with carved capitals, the whole being surmounted by a carved wheel cross.

Sir Gilbert Greenall, M.P., laid, on Saturday, the foundation stone of a church which is to be built for St. Peter's, Warrington. It will be erected by Mr. Hodkinson, builder, of Manchester, from designs by Mr. Medland Taylor, also of Manchester, on a site in Birchall-street, off Lythgoes-lane. The original proposition was to build a church to seat 700 persons, at a cost of £3,000; but it is now intended to expend at least £5,000.

An organ built by Messrs. Conacher and Son, of Huddersfield, at a cost of £230, was opened on Thursday, the 18th inst., at the Primitive Methodist Chapel, Pontefract.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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RECEIVED.—J. C. E.—B. of C.—W. L. B.—G. E. and Co.—T.—L. M. and Co.—F. and Co.—J. R.—C. C. and Son.—B. and T.—J. L. S.—K. and F.—S. Bros.

Correspondence.

THE INSTITUTE AND THE REGISTRATION BILL.

To the Editor of the BUILDING NEWS.

SIR,—I have been consulted by a Member of the House of Commons about a document which was sent to him and other Members, purporting to be a "statement on behalf of the Royal Institute of British Architects, against the second reading of the Architects' Registration Bill." Living at a distance, I have few opportunities of attending meetings of the Institute, and was not aware that one had been held to consider the subject, nor do I see any notice of such in the *Journal of Proceedings*, and I find that other members of the Institute resident in the large city to which I belong have not received any copy of the document, and are one and all ignorant of the fact of any such meeting having been held. Had we known, we should certainly have attended in large numbers, and protested against such a statement being issued on our behalf, for we are very decidedly in favour of the proposed legislation, though many, like myself, would have been better pleased had the initiative been taken by the Institute. Mr. H. R. Gough stated in your issue of the 12th inst. that the objections taken by the Institute to the late Col. Duncan's Bill had been met in the present one, "even to the exclusion of civil engineers and surveyors from its scope." From the new document to which I refer, and a copy of which I forward to you, we are brought face to face with the extraordinary fact, that whereas last year the Institute objected to the *inclusion* of civil engineers and surveyors, this year they object to their *exclusion!* I should be glad, Sir, if you would inform me when the meeting authorising the statement on behalf of the members was held, and I think we should be put in possession of the arguments used, and which seem to entirely reverse the objection taken last year, even though the Institute may not think it worth while to publish them. The subject is one occupying a vast amount of attention in France, where three national congresses of architects have carried resolutions in favour of such legislation, and is also being warmly taken up in Canada, Australia, and America. Surely it is time that the Institute published the report of its special registration committee to which Mr. Gough alludes. This would enable us all to form a better judgment upon the great question. The feeling amongst architects here, whether they be members of the R.I.B.A. or not, is strongly in favour of the measure, and I believe that were every member of the Institute invited to state in writing whether he is in favour of examination being made compulsory—not merely upon those desiring to become associates of that body, but upon all hereafter seeking to enter the profession—the result would prove that the opposition to this much-needed reform comes almost entirely from the Council of the Institute, backed up by some others who are perhaps seeking office, and afraid of offending the ruling powers of Conduit-street.—I am, &c.,

July 23. A FELLOW OF THE INSTITUTE.

THE ARCHITECTS' REGISTRATION BILL.

SIR,—In your last issue there is a notice to the effect that the Dundee Institute of Architecture have adopted the very proper course of petitioning the R.I.B.A. to support the Architects' Registration Bill. The Council of the R.I.B.A., however, have adopted the very improper one of circularising every member of the House of Commons, sending him a series of "Reasons against the passing of the Bill," *without in any way consulting the Fellows and Associates thereon.* It has been done quietly, underhandedly, without the knowledge of any outside the Council.

How do they know that the issue of such a circular would have been sanctioned by general meeting? Is the Bill the same as that of last year, and is the voting at the Institute in the same hands as it was then? I think not. Are the Council afraid to put the matter before a general meeting for fear of defeat in their efforts to thwart a movement for the well-being of the profession? It looks much like it. Poor Dundee Institute! I pity the members for the snubbing that is in store for them; but I admire them for taking the proper course in the matter.—I am, &c.,

ASSOCIATE R.I.B.A.

MARTYRED ST. ALBAN'S.

SIR,—Your correspondent, "A Northern Vicar," is like his hero Glib o' the Gab, and like him, too, in having more zeal than knowledge; but his ready rhetoric will never convince architects or antiquarians that the new works at St. Alban's are not bad—unmitigatedly bad and utterly deplorable.

"Vicar" accuses architects of being actuated by envy, jealousy, and ill-will. The frog which tries to swell itself to unattainable dimensions is actuated no doubt by such feelings; but the *Bos* species can only regard the ambitious aspirant with contempt, let him puff and blow as he will.

As architects are stigmatised with having base and ignoble feelings, might we not, by right of *lex talionis*, say in reply that the "Vicar" only lauds the noble lord from self-seeking motives? It is such sycophantic adulation from ignorant, and it may be *waiting*, people which confirms the would-be-thought architect in his pretensions and follies. What crass ignorance "Vicar" betrays! He is wrong about woodwork; but explanation would be useless. Is it not wonderful that a man with any common sense should defend the destruction of the old Norman turret because its circular shape was the "weakest of all forms"? Is it because of such weakness that builders chose it for chimneys carried up 300ft. high or more? Are not the Celtic round towers the oldest buildings we have? The old turret withstood the tempests for 700 years. Is that a proof of its weakness of form? You talk utter bosh, my good "Vicar." It is to be hoped your Sunday sermons are better than your weekday utterances, for they are weak indeed. "Vicar" informs us with respect to the woeful "sisters,"—most "daring conception"!—that "a very great professional architect" has done the same thing, and that such is to be found in several old works. I flatly deny it, as being incredible, and would say to him, Give your architect's name, and cite

your ancient examples. There is no need of reticence. Prove your words, or for evermore hold your peace.—I am, &c., M.

ST. ALBAN'S ABBEY.

SIR,—Suppose "Goth" comes to an anchor for a moment on the question of the inaccuracies and misrepresentations. Will he have the goodness to turn to the paragraph in our letter of July 12, referring to the "ancient painted ceiling"? Until this misrepresentation is acknowledged and withdrawn your correspondents are proving, by their very evasion of it, our statement that it is a waste of time to point out the inaccuracies in the Sheet of Contrasts. We can await "Goth's" leisure for his promised visit to St. Alban's, and are prepared at any time to answer him when the visit has been paid; but in the mean time, on his own confession, he is writing of what he knows nothing about.

We have no "grievances to put down in black and white," and there is nothing in our letter to warrant the inference that we "consider the readers of the 'B.N.' biased and prejudiced."

In one thing "Goth" is right—our position *is* exactly that of "Ars," and we are proud to be in such good company. This gentleman knows and writes the truth about St. Alban's Abbey, and it is for this reason that "although he has so often been contradicted, he has succeeded in setting up his main assertions so firmly again that the allegations of the last writer about his letters are as absurd as they are untrue."

The letter of "A Northern Vicar," from which we quote, will no doubt bring upon him the fate of all who venture to speak the truth about St. Alban's Abbey; but it should also bring at least "one word of defence or gratitude" from so many, also silence for good and all those who have nothing better to do than sneer at what is "in many respects the greatest work done in this age for his church by a single individual."

To "F.R.I.B.A." we have but one thing to say, and that is, that if he has any right to use the above letters, we should think that every other Fellow of the R.I.B.A. is thoroughly ashamed of him.—We are, &c.,

WM. LONGMIRE AND CO.

SIR,—"Save me from my friends" is a prayer Lord Grimthorpe now seems to need, for surely your correspondent, "A Northern Vicar," has put the finishing touch to the arguments on this subject by as fine a piece of sarcasm as could well be written upon it.

. . . . "Whether Lord Grimthorpe be 'our only architect' or not, he is the only living architect who has given us original new work, and yet at the fame time preserved the feeling and the genius of the best of the old." . . . .

"Stand at the N.E. corner of St. Alban's nave . . . . you cannot fail to be impressed with the perfectly harmonious satisfying termination to the vista afforded by the superb west window." . . . .

"When I contemplated from the meadow on the south side the daring conception of the 'Five Sisters Window,' it seemed to me to present the very embodiment of that union of soaring grace with massive strength which is the characteristic of the 'First Pointed' style," &c.

Of course all this is not serious: it reminds one of Gulliver's glowing description which he gives the King of Brobdingnag in his lofty language of the state of the aristocracy, the bishops, the judges, &c., in his own country, in order to show what these should be, but were not.

It is quite true that Chartres Cathedral has a round window; but "there are degrees" in these things as well as among poets, and the window under discussion is no more like the fine conceptions found in old work than a public-house sign is like a picture by Sir F. Leighton; but there are people who will always say of any building that happens to have a dome, "It is just like St. Paul's."

If the mullions and tracery of a window support the wall above it, of what use is the arched head of the window itself, and how does the superstructure maintain its position when the mullions and tracery have been knocked out, examples of which can be seen in the ruined abbeys of this or any other country?—I am, &c.,

A. C. W.

SIR,—This correspondence may go on for ever if conducted by such people as most of my opponents, who ignore such things in my letters as do not suit their views, and attribute to me what I never said.

"F.R.I.B.A." describes me as your "Cork correspondent," because I happen to know Cork Cathedral, and he does not. I said long ago, as he does (and I was flatly contradicted), that the choir clerestory windows were patched with Roman cement. Where the *brown clay* is, he had better consult my last letter to find out: he seems to know nothing about it, for all his boasted knowledge of the Abbey. Anyone can see that Steinmetz's drawings are only fancy sketches. Messrs. Longmire, with their accurate measurements, can point out his errors. It is worthy of "An A.S.S." to refer to Neale's plates as an authority, seeing Chapple found an error of *four feet* in his height of walls.

I think "A Hertfordshire Layman" had better hold his tongue. Like my other opponents, he is singularly unlucky in his attacks on me. Last August (and probably long before) the large white marble cross was *in situ* at Winchester, done, I presume, by Mr. Sedding, as Mr. S.'s claim on the Dean and Chapter was dated some months later—in January, I think. I wish Dean Kitchin would publish this "little bill." At the same rate, Lord G.'s would have paid an architect above £10,000! I do deny that Hems and his friends had seen the Cork and Salisbury statues at the time of their writing, on the very sufficient ground that they were quite unable to assert that they knew them, except by photos.—indeed, I do not think they said so much as to Cork; and when Hems's advocate, "Who Wants to Know," was closely pressed by me, he started a disquisition on the Cork nave!

By all means, as "A Hertfordshire Layman" says, let the Abbey be visited by unprejudiced persons—such as "A Northern Vicar," who, in most temperate language, expresses the views of ninety-nine hundredths of people who take the trouble to think about the matter. I can only make a vague conjecture as to his identity; but must thank him for his valuable letter. He clearly knows St. Alban's well, and very properly thinks, as I do, that we who employ architects have every right to criticise their work. What does your "A.S.S." say to *his* account of the bishop's views? "A Hertfordshire Layman" is very anxious to preserve St. Alban's Abbey. Will he give (or Mr. Gough either) more to the "defence fund" than he will to a new organ? I trow not.

I am very glad to have amused your genial "Goth." It is amusing to me to find that he is ready to round on the greatest Goth (with Burges) since Mediæval times—Mr. J. L. Pearson; first, for his Westminster N. window, which he could not see, and now for proposed works at Rochester, which he calls "Grimthorpean"; and he starts the theory, apparently, that I am Dean Hole! Why does he not attack the ugly buildings on W. side of Westminster Hall? Is it because Lord G. (like everyone else) does not like them?

And now, Sir, as for some weeks I shall be out of reach of my "B.N.," I wonder if my adversaries will have the chivalry not to stab me in the back during my absence?—I am, &c.,

July 21. ARS.

P.S.—In my last, "in church" is printed in error for "in clunch," referring to clerestory windows. The Dean and Chapter of Winchester *did* complete the screen from Mr. Sedding's drawings; he, therefore, is responsible for the handsome white marble cross. Mr. S. modestly asked £80 for his drawing, and £60 for travelling expenses (66 miles), besides other items in proportion.

WHO'S WHO?

SIR,—Is it not time that we had published a glossary, explanatory directory, or whatever it may be called, in order that we may be enabled to know who's who and what's what? I am getting confused, I confess, as to the alarming extension of initial letters after the names of some persons who are professional or otherwise. Yesterday I had a neat card with the name of a gentleman who called himself "F. C. P." I tried to guess, but could not, until I remembered about a leaky gas-pipe, and found it to be an attentive call from my plumber. The alphabetical array following the names of engineers, architects, and surveyors I can manage to interpret. I have also mastered the "F. C. A." of my accountant; but the other day I found an auctioneer's poster with the name of Mr. Hammer (let us say), followed by several large capital letters, which I don't understand. Let us, Sir, by all means have a glossary, or index, or explanation of some sort, before the matter gets too many for us and we are lost. If my "C. P." mends my gas-pipe, why may not my "A. P. B." (Authorised Pork Butcher) supply my sausages, and my "C. C. S." (Certificated Chimney Sweeper) clean my flues? Fancy my mistaking my auctioneer for an "A. S. S.," when he is really a member of the Associated Society of Salesmen! Kindly permit this important matter to be ventilated through your columns.—I am, &c.,

PERPLEXED.

THE ARCHITECTURAL TREATMENT OF GRANITE.

SIR,—Granite, as a material in architectural construction, appears to be gaining so much in favour, and obviously requires such different treatment from ordinary freestone, that it is surprising we have not been favoured with something better than anything we have yet seen in granite architecture. The new police-court on the Embankment and Lloyd's new bank in Lombard-street might have been designed to be executed in the softest stone for any evidence they manifest of special consideration of the granite with which they are largely constructed. This is not as it used to be. In olden times the material determined the character of the design, and it was the strict attention to this principle that helped in the production of the *chefs-d'œuvre* with which we are acquainted. The worker in bronze did not imitate the worker in wood. Egyptian architecture was strikingly different from Greek or Roman, and it is, perhaps, quite safe to say that their material caused the difference.

It is not, of course, to be expected that a suitable style can be invented straight off; but granite building in London is not a thing of to-day. I venture, therefore, to think it is time that something better and more appropriate than anything we have yet seen was done in that material.

Architectural style has always been a matter of evolution. Every new style was based upon something that had gone before. Let us, in this matter of granite architecture, try to do likewise, and we shall, perhaps, succeed beyond our expectations. There was a decorative treatment common throughout central and southern Italy during the whole of the 13th century that seems, to my mind, well suited for this purpose. I refer to the Cosmati work at Rome, Anagui, Subiaco, Civita Castellano, and other places, executed by Lorenzo Cosmas and his descendants, Lucas, Jacobus, Adeotatus, and Johannes. The celebrated Arnolfo di Lapo, or Cambio, worked in this style. The nature of the work may be briefly described as the ornamentation of white marble structures with narrow bands of geometrical mosaic of two or more colours, forming circular, square, or lozenge-shaped panels on friezes and pilasters. In the centre of the panel was a slab of verde or rosso antico. These bands also decorated columns—spirally, perpendicularly, and in chevrons. In all cases a space of plain marble, at least the width of the band, was left between adjacent bands or mouldings. The portico of the basilica of San Lorenzo, in Rome, and the façade of the church at Civita-Castellano are good examples. There are also a few pieces in the Italian Court of the South Kensington Museum; and there is the pavement in Westminster Abbey, laid by Italians brought over by Abbot Ware. This decoration seems to me suitable for granite, because it is all in one smooth plane, and because it is of itself so satisfying to the artistic instinct that the cornices and strings might be of the simplest character, and formed of mere splays and fascias. Thus an appropriate character would be given to a granite building, and the polishing of the surface (an essential process in granite work) would be facilitated. There would be no difficulty in carrying out Cosmati work in granites, as there is now no difficulty in getting all the necessary colours from British quarries—white from Kemnay or Gunnislake, through greys, reds, greens, and blues to the black of Rowley Regis. As to cost, considering that granite can now be worked and polished with extraordinary rapidity by machinery invented for the purpose, there is no reason that work such as I have described should be more expensive than elaborate carved stonework. As an economical and comparative question, moreover, the fact must be taken into account that the granite structure would be imperishable, whereas the stone building would be

liable to rapid decay in the London atmosphere. Another advantage in our fuliginous climate of the hard polished surface of granite is its perennial cleanliness.—I am, &c.,

H. TRAVIS.

Buckleigh-road, Streatham, July 23.

UTILISATION OF SEWAGE.

SIR,—I notice in your issue of the 19th an extract from a letter written to the *Morning Post* by Dr. Drysdale upon the above subject. The Berlin Sewage Farm is stated to be a success, but such a statement in the face of the following fact seems very erroneous:—"The Tell Tower See, into which the effluent of one of the Berlin irrigation fields flows, has been so contaminated by its effects as to give rise to legal proceedings against the city of Berlin."

Coming home we find that at Stratford-on-Avon damages of £1,000 have recently been recovered against the local sanitary authority for the nuisance caused by their sewage irrigation. A few days ago an analysis appeared in the *Leeds Mercury* of water taken from the river Wharfe, at Ilkley, which analysis proved that the river was disgustingly polluted by the effluent from the filtration areas in that town, and yet we find a neighbouring local authority proposing to dispose of their sewage upon very similar lines—viz., by first applying chemical precipitants to the sewage, and afterwards passing the clarified sewage on to a very limited area of land.

Birmingham is also mentioned by Dr. Drysdale. The facts in this case are that in 1885 the purification of the sewage by precipitation and land filtration cost £14,205 0s. 5d There was a loss on the farm alone of £2,813 14s. 2d., and yet sewage farms are stated to realise big profits. How can vegetation of any kind succeed upon land which is being continually charged with large doses of sewage? Many recent cases of the failure of both irrigation and filtration schemes could be given; but I will not trespass further upon your valuable columns.—I am, &c.,

SANITAS.

Intercommunication.

QUESTIONS.

[10046.]—**Warren Girder.**—Thanking Mr. Adams for his last answer, I should be glad to know how the strains in Fig. 109, Plate 6, are obtained. The two bars, on the apex of which the load rests, would be equally strained according to parallelogram of forces, and the pressure on abutments also equal. In Fig. 94 the bottom flange of end bay is ·5 ×, obtained by a line parallel to end bar; a line is also drawn parallel to bottom flange, thus showing a strain: the diagram shows it not strained. In the case of the rafter, Fig. 119, do the lines A B, B C, A E in Fig. 120 indicate any strain, and if so, on what parts? In Fig. 118 the sides have been opened. How is this obtained? —IN THE DARK.

[10047.]—**Cottage Hospitals.**—Would some of your kind readers inform me of a small book on the planning of cottage hospitals, giving price and all particulars to—X. Y. Z.

[10048.]—**Eaves Boards, &c.**—What is a "lear board?" and how does it differ from an "eaves board"? When a feather-edge eaves board is used, is a tilting fillet also required?—R.

[10049.]—**Ancient Lights.**—Kindly inform reader if a greenhouse side-light can be claimed to be an ancient light if it has existed the time that an ordinary light would have to exist. The facts are as follows:—I have a piece of ground surrounded by walls; the side of a greenhouse rests on one of them, the greenhouse belonging to the adjoining owner. There is a glass roof, also a glass front and two glass ends, one overlooking my ground, so you see they have plenty of light without the end overlooking my ground. I wish to build close up to this end, thus blocking the same. Would you kindly inform if I can do so?—E. J. MASON.

[10050.]—**Bradford Junior Society of Architects and Surveyors.**—This society has just been formed, constituted of pupils and assistants of Bradford, for sketching in summer and lectures and debates, &c., in winter. I should be greatly obliged if any of your correspondents would say where similar societies are established, and how they are carried on. This is to be carried on entirely by the juniors, and not by practising architects.—HENRY B. LONGLEY, Hon. Sec.

[10051.]—**Insects in Wood.**—What are the best means to adopt to destroy, and afterwards prevent, insects in wood? In the cases in question they are destroying a dining-table and rustic summer-house, the parts of which are fairly riddled with holes.—MOSELEY, Carlisle.

REPLIES.

[10025.]—**Right of Light.**—Those gentlemen who answered last week have, I think, misunderstood the question, which states that the wall has been built up for 20 years. My answer in the previous number was correct. —H. L.

[10030.]—**Damp-proof Course.**—The contractor is bound to execute the course with the specified material. If the material laid is not efficient, the builder can be called upon to put in another course. Someone is to blame in not seeing that the specified course was laid. The better plan is now to test the course before the builder is called upon to make good.—G.

[10034.]—**Lead and Lime.**—When sheet lead is used for a dampcourse, lime should not be allowed to touch it, but either Roman or Portland cement used. Sometimes slates are used for the dampcourse, but in time their usefulness is marred by bedding them in lime, instead of with cement both on bottom and on top.—W. P. BUCHAN.

[10034.]—**Lead and Lime.**—If sheet-iron is used as a dampcourse, it should be laid on a thin bed of fine clean sand, and the brick or stone immediately on the top of the lead should also be bedded in sand.—W. B,

[10036.] — **Architects' Charges.** — "Provincial Architect" has no claim against the society.—H. L.

[10036.]—**Architects' Charges.**—The design referred to being unregistered, the owner has no legal *locus standi*. As with many other evils—he must e'en "grin and bear it."—M.

[10037.] — **Gradient of Sewer.** — "Lancashire" will find all the information he seeks in Molesworth's Engineers' Pocket-book, under the heading of "Flow of Water in Sewers." The following is the formula:—

x = Area of sewer ÷ wetted perimeter in feet.
f = Fall in feet per mile.
V = Velocity in feet per minute.

$$V = 55\sqrt{x \times 2f}.$$

At a fall of 1 in 150 the velocity would be—

$$55\sqrt{\cdot 50 \times 2 \times 35\cdot 2} = 55\sqrt{35\cdot 2} = 55 \times 5\cdot 92 = 325\cdot 6\text{ft. per minute} = 5\cdot 42\text{ft. per second.}$$

And at a fall of 1 in 600—

$$55\sqrt{\cdot 50 \times 2 \times 8\cdot 8} = 55\sqrt{8\cdot 8} = 55 \times 2\cdot 96 = 162\cdot 8\text{ per minute} = 2\cdot 71\text{ft. per second.}$$

—W. B.

[10038.]—**Faulty Wall.**—The design is signally bad. There must needs be thrust from the lean-to roof, and I should expect the 14in. wall not only to bulge but to fall. —M.

[10038.]—**Faulty Wall.**—I consider that the walls should have been 18in. thick up to the second floor, and then a few piers above; but without complete plans and sections it is difficult to decide accurately.—H. LOVEGROVE.

[10038.]—**Faulty Wall.**—I have been engaged in the practical department of building for the last 28 years, and in all my experience I never saw such a rash attempt at construction; the wall should not be less than 24in. thick if built of solid brickwork, and 30in. thick if of stone rubble. Your architect is to blame.—E. C., Architect.

[10038.]—**Faulty Wall.**—The architect having prepared the plans and specification required for the construction of the storehouse to his entire satisfaction and supervision, and the contractor having carried out the works to the true intent and meaning of such signed drawings and specifications, I should then conclude that the contractor is entitled to receive payment of the balance, and should also say that he is free of all blame, as it is the architect's duty to see that his plans are worked out to retain the work the premises have to contend with.—W. PROPER, Gorey.

[10038.]—**Faulty Wall.**—If the section is a correct representation of the principle of construction shown by the architect's drawing, and the building consrructed according to same, the contractor cannot be held responsible for the bulging of front wall. It would be difficult to produce a drawing showing more gross ignorance and entire want of the most elementary principles of building construction. The section indicates very clearly the want of proper provision for the expansion of the concrete floors, sufficient of itself to bulge any wall double the thickness of that in question. According to the section, the foot of principal rafter is not tied, but simply resting in the wall-head, and must be thrusting the wall outwards. In a word, the front wall must be in a very dangerous condition, and may fall outwards at any moment. My opinion is that the architect is to blame for the faulty construction and bulging of the wall, and ties should be inserted without delay.—W. B.

[10039.]—**Right of Way under the Altar.**—I do not know Hythe; but the passages under the altar at Norwich, St. Gregory, and Walpole St. Peter are manifestly there because the chancels reach to E. limit of churchyard, and right of way could not be stopped. A curious footpath exists in the neighbouring churchyard of Tydd St. Giles, Cambs. A former rector pulled down the chancel to save cost of repairs; but the footpath from S.W. to N.E. still keeps along S. side of former chancel, and only turns round where its E. end once stood.—ARS.

[10039.]—**Right of Way under the Altar.**—In the case of Hythe Church I have always considered that the fall in the ground induced the designer to form the crypt, which may have been used as an ambulatory in the Middle ages, the procession passing round the church outside.—H. L.

[10039.]—**Right of Way under the Altar.**—The groined crypt under altar at Hythe parish church is simply an ossuarium, and built as such. The idea of its being a passage-way originates probably in its having a doorway at each end; but that was merely to give ready access for the grave-digger to deposit such human remains as he met with at his work. It was placed under the altar of chancel because there height could be best got, and the altar over would give sanctity and security to the remains. Graves were in early times, I believe, much less deep than now, and as common folk had no freehold in the grave and no monumental memorial, there was a not unfrequent finding of bones, and the need for a place to contain them. There was, until a few years ago, an ossuarium on the north side of chancel of Stratford-on-Avon Church; but this has been most unrighteously restored away—destroyed. The doorway of it exists close to Shakespeare's grave, and it seems to me highly probable that it was the lugubrious sight of this charnel-house which gave origin to the well-known verse on the tombstone, probably put there by the poet's wife, and perhaps composed by her. Certes, the poet had nothing to do with the doggrel. The ossuarium was sometimes connected with a chantry-chapel, as at Norwich—the present free school.—M.

[10041.]—**Sketching Tour in Devonshire.**—I should advise "M." to get Murray's guide-book for the county. He can judge by the description if the churches of his district are worth seeing, and will see by the map his way to them. I would lend one.—M.

[10042.]—**Testing House Drains.**—"Inquirer" cannot do better than stop the outlet, and fill all the gullies, &c., with water. If the water runs away, the drains will be found to be faulty.—H. L.

[10042.]—**Testing House Drains.**—House drains are best tested with a smoke-testing machine. "Inquirer" may see several styles of machine and their mode of application illustrated in the fifth edition of my book on Plumbing and House Drainage. Where there is sufficient water pressure the small new water-power smoke-testing machine, invented a few months ago by Messrs. Fyfe and Dobson, sanitary inspectors, Glasgow, gives a severe test. —W. P. BUCHAN.

[10042.] — **Testing House Drains.**—Different methods are practised by sanitary engineers, of which each has its special advantages; but for convenience and efficiency, the appliance that I should recommend would be "the Banner patent drain grenade or drain ferret," sold in boxes at about 6s. a dozen, of which one single grenade is usually sufficient for testing an ordinary house-drain. Any information respecting same can be obtained from the Banner Sanitation Co.—W. PROPER, Gorey.

[10042.]—**Testing House Drains.**—I would advise "Inquirer" to plug up the drains at disconnecting trap and upright eyes with stiff clay, supported and loaded to resist the pressure of water to be applied when testing, and afterwards fill the drains with water at an upturned branch or eye at the highest point in the drainage system. All the fireclay drains in connection with a dwelling-house should be perfectly watertight under 10ft. of water in column, or at least a column of water equal to the deepest part of drain. A smoke test, if applied with a good machine (Burn and Baillie's patent, Edinburgh), will show all the defects in old drains and fittings.—W. B.

[10043.] — **Open Spiral Staircase.** — The most notable open spiral staircase that I know of in Germany or elsewhere is that to upper part of steeple of Strasburg Cathedral; but this is Gothic. I doubt the existence of Renaissance examples in Germany.—M.

[10044.]—**Churches with Chancels not in the same Axis.**—The chancel of Holy Trinity Church, Stratford-on-Avon, is a case in point. A plan of it is on the view of the church lately published in the BUILDING NEWS, and from which the angle could be obtained. "H." would seem disposed to treat the matter scientifically. It appears to me there is plain evidence that the deviation is an accidental circumstance occasioned by bad setting out. I have measured a great number of old churches, and have always found a difficulty in working out my dimensions for the simple reason that the walls are rarely at right angles. In Bowman and Crowther's most carefully measured and drawn plans of churches you can plainly see the inaccuracy of the general setting out (Etton, Frampton, Threckingham), so that there is no need for wonder that the chancels are divergent. The thing only occurs in comparatively small churches. In large buildings where there was more ability and better care, the inclined chancel is not found.—M.

[10044.]—**Churches with Chancels not in the same Axis.**—Your correspondent, "H.," will find an example of divergent chancel in Pulborough Church, Sussex, about half a mile from the Pulborough station, on the Mid-Sussex Railway, L.B. and S. Coast line.—HENRY LAWRENCE.

[10045.]—**Competitions.**—I am afraid that "Outline" has no remedy, and might waste his money in law. If he goes in for competitions, he must be prepared for anything.—H. L.

[10045.]—**Competitions.**—In competing, "grease, dust, and dirt" must be regarded as possible contingencies, and although want of care is reprehensible, yet there is no engagement and no responsibility, and "Outline" has no redress.—M.

The memorial-stones of a Wesleyan Chapel, which is in course of construction at West Kirby, near Liverpool, were laid on Saturday. The building consists of an assembly-room, a vestry, and three class-rooms. One of the latter is to be used as an infants' room, and the others are so arranged as to serve as transepts opening into the assembly-room by means of rolling partitions. The material is local sandstone, rock-faced, with dressed stone for the front windows, coping, &c. Accommodation is provided for 400 persons. The style is Gothic. The architect is Mr. John Wills, of Derby, and the builder Mr. W. Christian, of West Kirby. The contract for the building is £915, exclusive of the cost of furniture, land, &c. At a later stage the chapel will be completed to seat 800 people, and will cost £3,000.

A new Roman Catholic church is being built in Westmoreland-row, Tynemouth. The architect is Mr. E. J. Hansom, of the firm of Messrs. Dunn, Hansom, and Dunn, of Newcastle-on-Tyne. The new church will be 70ft. long by about 29ft. wide, and will accommodate 250 worshippers. It is to be built of pressed bricks and dressed freestone. The style is Early Decorated Gothic. The roof is to be of open-timber work of pitch pine, and a dado of the same material runs round the building. The floor is to be laid with wooden blocks, and the aisle with encaustic tiles. The work has been intrusted to Mr. W. Foggin, contractor, of Newcastle, and the cost is about £1,500.

WATER SUPPLY AND SANITARY MATTERS.

DEATH FROM DEFECTIVE DRAINAGE AT COVENTRY.—Last week the adjourned inquiry touching the death of John Albert Butler, of 9, Lincoln-terrace, Foleshill-road, Coventry, was resumed before Mr. Deputy-coroner Masser, at St. Mary's Hall. The Town Clerk (Mr. T. Browett) represented the Sanitary Authority, and there were also present the city surveyor (Mr. E. J. Purnell), Councillor Rowland Hill, &c. The deceased went to live in his house, which was a new one, last November. Two months ago a very offensive smell was perceptible, and on examination it was found to come from a pump placed in the kitchen, and which was used for washing purposes. On Whit-Sunday the deceased was taken ill, and at that time the stench had increased, and there was an offensive odour emanating from a lamp-hole in the garden. The drainage of the property ran in a line with the residence of the deceased, and when complaint was made of the smells the drains were opened, and there was found a congregation of sewage matter. Further inspection was made with the result that it was discovered that there was nothing flowing down the house-drain, and at a distance of 23ft. from the main drain there was a stoppage at a joint, and sewage matter was oozing from it. A rod was brought into requisition, with the result that the stoppage was removed, and when the water came down a piece of drain-pipe 7½in. by 5½in. came out at the junction. This was found to be broken at the collar, rags and sewage matter were clogged to it, and in the opinion of the city surveyor this was the sole cause of the drains being stopped. The soil adjoining the house was saturated with sewage, the water in the cistern in the house was contaminated, and the house drain had sunk. The Medical Officer of Health attributed death to the defective condition of the drains, and the jury, in returning a verdict to that effect, added a rider stating that there was no evidence to show how the obstacle came into the drain, and expressed the hope that the city surveyor would be able to devise a scheme whereby there might be better inspection of the interior of drains.

CHIPS.

The Mayor of Pontefract turned yesterday (Thursday) the first sod in connection with the new waterworks at Roall, and afterwards entertained the members of the Corporation and distinguished guests to luncheon in the Town-hall. The scheme will entail an expenditure of about £23,000. The contractor intrusted to carry out the works is Mr. Vickers, of Nottingham, and the engineer for the scheme is Mr. George Hodson, of Loughborough.

The local board of Hornsey at their last meeting decided to increase the salary of Mr. T. de Courcy Meade, their surveyor and engineer, by £100 for the ensuing year, another £50 from the 1st July, 1890, and a similar increase from July, 1891, making a total of £700 per annum. Mr. Meade was a candidate for the post of borough surveyor to the Leicester town council, vacated by Mr. Joseph Gordon, on appointment as engineer to the London County Council.

In the House of Lords, on Monday, the Metropolitan Improvements Bill, which empowers the County Council to maintain, as an ornamental space, the land in the centre of Piccadilly-circus, came before the committee. All the portions of the Bill were passed except a formal clause, for the settlement of which an adjournment was granted.

On Wednesday week the top corner stone of the new north aisle of St. John's Church, Cardiff, was placed by the Bishop of Llandaff. The aisle will afford additional accommodation for about 200 worshippers. Its length is 64ft., and its width 14ft. 8in., the whole of the available space between the old church and the road being taken up. A baptistery has been formed in the west end of the old north aisle. The contractors are Messrs. Shepton and Sons. The cost of the restoration and additions has been £13,000.

The governors of the Chelmsford grammar school have received thirteen sets of plans for the new buildings from architects, and have, after inspection, reduced the number to seven.

The new Roman Catholic church in Guildhall-street, Folkestone, was opened on Wednesday week. It is dedicated to Our Lady Help of Christians and to St. Aloysius, and has been built from plans by Mr. Leonard Stokes, P.A.A., of London.

John Edward Stannard, builder, of Aldeburgh, member of the town council, member of the church choir, and Freemason, was committed for trial last week on the charge of having, between the 1st and 6th days of March, in this year, being the bailee of a certain quantity of lead and solder, the goods and property of Henry Thompson, vicar of the parish, did fraudulently take and convert 2,716lb. weight, or thereabouts, to his own use, thereby feloniously did steal the same. Defendant pleaded not guilty.

PARLIAMENTARY NOTES.

NATIONAL PORTRAIT GALLERY BILL.—Lord Henniker last week moved the second reading of this Bill. An offer had been made by a gentleman who did not wish his name published to build a National Portrait Gallery at his own expense, if the Government would procure a site within one mile of St. James's-street. The site provided by the Bill was on the north-east of the National Gallery, and had been approved by the donor and trustees of the National Portrait Gallery. The trustees had agreed to the site being taken, on the understanding that space should be taken from the St. George's Barrack yard at some future time for any extension of their collection. The proposed site had been pronounced to be sufficient by an eminent architect, who had prepared sketch plans, and who considered it would be a great advantage if the plot of ground on the north of Hemming's-row, which was now vacant, should be kept an open space; it would not only secure a better light, but, if kept an open space, a better protection. Lord Hardinge remarked that it was very desirable some sort of arrangement should be made without delay by her Majesty's Government with the London County Council with a view to securing the open plot of ground referred to. Whether it was an imperial or municipal question, it was necessary something should be done. After the strong expression of the architect it was quite on the cards the anonymous donor would cry off, and say, "I will have nothing to do with it." Considering the Government had not so far advanced a sou towards the undertaking, he trusted they would spend £7,000—virtually a trifling sum—in buying that open space. Lord Rosebery said that, whatever might be the deficiencies of the London County Council, they were not averse to the acquisition or maintenance of open spaces, if proved to the interests of London and the ratepayers. It was clear and necessary for that building that that piece of land should not be built upon. That, however, was not a matter which concerned the London County Council. It was not a municipal, but an imperial building, in so far as it was proposed to keep the portraits of those all who had rendered service to the Empire. Not as a member of the London County Council, but speaking as one having held the position of First Commissioner of Works, he thought her Majesty's Government would not be paying an undue, unlicensed, or extravagant contribution if, after £100,000 had been promised, they were to pay £7,000. The Bill was read a second time.

THE PARLIAMENT-STREET IMPROVEMENTS.—Lord Lamington asked what was being done in regard to the Parliament-street improvements. It was now two years since the Act had been passed to widen that thoroughfare, and to generally improve the neighbourhood of the Houses of Parliament, and yet the company entrusted with the work seemed to have done nothing. Lord Henniker explained that there was a stipulation in the Bill referred to that the sum of £500,000 should be first subscribed in share capital before commencing the work. The arrangements for complying with the Act had not yet been completed, but it was expected that the necessary certificate of the Board of Trade, that the capital had been subscribed, could be obtained in a month from the present time (hear, hear). The Company, he might say, was entirely a private undertaking, and the matter was not one for which the Office of Works could be responsible.

WESTMINSTER HALL.—Lord Henniker, in reply to Lord Wemyss, stated that plans for the staircases in Westminster Hall were in the first place submitted to a Select Committee of the House of Commons, and were approved. He admitted it was always a good thing to have a model of improved buildings. But his noble friend must remember a model entailed a great deal of expense, and on the occasion alluded to it was not deemed expedient or necessary to have a model. A general attack on all the plans had been made by his noble friend, and yet they were approved by a Select Committee. Four staircases had existed from the earliest time in Westminster Hall, and those now erected were intended as a reproduction, and not as a new departure. Mr. Pearson's work restored the old work as nearly as possible, and the First Commissioner of Works had decided not to remove those staircases. With regard to the approaches to Constitution-hill it was intended at once to level the ground on the Constitution-hill side of the arch by the workmen of the Board of Works. The vestry of St. George's, Hanover-square, had promised to level the other side.

The National Portrait Gallery Bill having passed its third reading in the House of Lords on Tuesday night, only awaits the Royal assent to become an enactment.

A large clock has been erected at the Bradwell Church, near Buxton, by John Smith and Sons, Midland Clock Works, Derby. It strikes the hours, chimes the Cambridge quarters, and has two dials, each 5ft. across.

STATUES, MEMORIALS, &c.

LLANDUDNO.—Some few months ago the Town Commissioners advertised for designs and estimates for a drinking fountain to be erected in the Happy Valley, recently presented by Lord Mostyn to the town as a public park. Twenty-six designs were sent in, and the one submitted by Mr. James Maddock, of Smithfield-road, Shrewsbury, and designed by Mr. A. B. Deakin, architect, also of Shrewsbury, was eventually selected. The design takes the form of a domed canopy, supported on arches, and resting on four polished grey granite columns, with panelled stone pedestals and carved caps. These pedestals will be united to a larger central pedestal, on which will rest a bronze statue of the Queen. Two sides of the central pedestal will have dove marble bowls, and a constant flow of water; the other two sides will be occupied by sculptured coats of arms. The dome will be octagonal and panelled, and surmounted by a small cupola, the terminal of which will be carved to represent the Prince of Wales' feathers. The four angles will be filled up with ornamental stone vases. The whole will be executed in red Mansfield stone, with dove marble panels, mostly filled with inscriptions. The total height will be about 20ft., and the width about 7ft., exclusive of four broad York stone steps all round same. Mr. Maddock has received instructions to proceed with the work.

LEGAL INTELLIGENCE.

A BIRMINGHAM BUILDER AND HIS TIMEKEEPER.—At the West Bromwich County Court on Friday last, before Judge Griffiths, an action was brought by Henry Caulfield, of Newhall-street, Birmingham, builder, to recover £21 from James Nightingale, of Merivale-road, Wolverhampton, timekeeper. Mr. Pritchett said the plaintiff had two building contracts—one at Oldbury and the other at Selly Oak—and defendant acted as his foreman and timekeeper on those jobs. His duty was to take the time of the men employed, and he was also intrusted with money to meet a custom of the trade of allowing the men to draw on account of their wages. Plantiff also authorised the defendant to dispose of the scaffolding when the contract was finished. Defendant pleaded a counter-claim amounting to £17 5s. 10d. Defendant said he was engaged as a foreman-carpenter. After the discharge of a man named Plant he acted as a timekeeper. The Judge disallowed certain items in the claim and counter-claim, after which the question of accounts was referred to Mr. Davey (deputy registrar), costs to be allowed on the claim and counter-claim as costs in separate actions. The counsels' fees were also allowed.

GREENHOUSE A BUILDING.—At the Dalston Police Court, on the 18th instant, Mr. H. Lovegrove, District Surveyor of South Islington, summoned Mr. Oldis, builder, of Finsbury Park, for erecting a greenhouse addition to a house in Highbury Quadrant, without giving the usual notice. Mr. Bros, the magistrate, decided that the structure was a building, and imposed a fine and granted the district surveyor his costs.

FEES.—Mr. Thos. Quinn, M.P., was summoned by Mr. H. Lovegrove at Clerkenwell for neglect to pay fees on blocks of model dwellings in Canonbury. Mr. Corser made an order for payment in fourteen days, with costs.

CHIPS.

The scheme for providing a new pier for Southampton, or, rather, for extending the existing structure, is making progress, the Harbour Board at the meeting last week having approved of contract-plans drawn by the surveyor, and directing that the same be forwarded to the Board of Trade for their sanction. The scheme is based upon recommendations made by Sir Douglas Fox, C.E., who was called in last year to report, as an expert, on the best way of utilising and enlarging the existing structure.

Some years ago the belfry of St. Andrew's parish church, at Condover, was condemned, by reason of its age and manifest weakness, as no longer safe; but recently the task of renovating and improving the belfry was taken in hand, under the supervision of Mr. Horton, architect, of Wellington. An entirely new bell platform has been constructed, and the eight bells have been renovated by Mr. Price, of Shrewsbury. An alteration that was carried out at the same time was the removal of the font from the belfry to the entrance to the nave.

The new gallery now being built from the designs of Mr. Borough Hill for the Southampton Art Society is now approaching completion, and it is hoped will be dry and quite ready for the annual exhibition, which will be held in October, under the presidency of Major-General Lacy, of the Ordnance Department.

New markets are being erected at Rotherham, and special attention has been paid to the ventilation, which is carried out on the Boyle system.

Our Office Table.

THE police authorities having expressed a desire to have a light fire-escape capable of being worked by one man, or, at the most, by two men, Captain Shaw invited a competition of the leading fire-escape makers. Four makers competed, with the result that Messrs. E. H. Bayley and Co., of 42, Newington-causeway, London, were the successful competitors. The escape they have produced can be worked by one man, and is of the usual style of construction, but consists of only two ladders, which can be extended to a height of 30ft. There is a novel method of instantaneously scotching both the wheels at the same time. It is intended to keep one of these machines at every police-station, so that, on a fire alarm being received, one policeman can run the escape to the fire, and work it without other aid.

PROFESSOR BEARE, of the Heriot-Watt College, Edinburgh, has been appointed Professor of Engineering in University College, London, in succession to Mr. Alexander B. W. Kennedy, F.R.S., who has resigned in order to devote his whole time to practise as an engineer. The professorship in University College, London, is the oldest engineering professorship in the kingdom. The *Scotsman*, in announcing the appointment, says:—"Much success has attended Professor Beare's work in Edinburgh. His teaching has attracted large numbers of students, every one of whom has the highest regard for Professor Beare and appreciation of his teaching. It is to him that the organisation of the engineering department and the arrangement of the engineering laboratories are due."

IT is said that in the new addition to the American Museum of Natural History will be used the largest box or rivetted girders ever used in the construction of a building. These girders were designed by Mr. J. Cleveland Cady, the architect, to support the floors and partitions, and thus obviate the use of pillars or columns, the object being to give unobstructed floor room for the display of specimens. There are twenty-eight of these girders, measuring about 62ft. in length, and weighing 40,000lb. each. They were landed on the North River front of New York in the neighbourhood of Fiftieth-street, and the possibilities of modern trucking have been taxed in vain to transport them to their destination at Manhattan-square. The longest and strongest trucks to be found were brought into requisition, and with twelve horses harnessed to each truck the attempt began. One truck collapsed in Fifty-seventh-street, near Tenth-avenue, another at Seventy-seventh-street and Ninth-avenue, while a third, which was fortunate enough to reach the square without mishap, buried its wheels to their hubs and stuck fast as soon as it left the pavement of the street. The contractors, therefore, found it necessary to construct a tramway across the square from Ninth-avenue to the building for the transportation of the girders.

AT the midsummer festival of the College for Working Women, at Fitzroy-street, London, last week, Mr. J. C. Horsley, R.A., addressed the students on dress-cutting, with which he said as a subject painter he had had an immense deal to do all his life, either personally or through efficient aid. He did not see why sensible, well-educated women should not put their feet down and stamp out the atrocities of fashion. Crinoline and dress-improvers were among the most atrocious things ever invented. He was happy to say that his wife and many ladies of his acquaintance never expended a halfpenny on crinoline. There were horrible rumours that it was going to be revived. If such a design could be brought home to anyone, whether he lived in Paris or elsewhere, he ought to be hung higher than was Haman. As to that dreadful thing called a dress-improver, it was entirely against nature. It might be an exceedingly good thing for a woman with a large family to carry a full-grown child upon, or as a bracket for a lamp. He had hoped soon to see an end of it, but only the day before he saw the most atrocious example that he ever met with in his life. He would not touch on that horror of horrors a small waist, the sight of which always gave him a positive pain in his heart. Nothing was more charming than to see a well, reasonably dressed woman; but dress was intended to clothe form, not to ignore it, and the moment they saw a fashion that was against natural form they might be sure that it was wrong.

CHIPS.

Mr. Daniel John Ebbetts, A.R.I.B.A., of Bedford Park, W., was on Tuesday last appointed surveyor to the local board of Acton, Middlesex. There were nearly a hundred applicants, from which number six were chosen for the final election, and the ultimate choice was unanimous. The appointment is worth £350 per annum.

Sir Arthur Blomfield, A.R.A., has been intrusted with the restoration of St. Mary Overie, Southwark, and the work is to be proceeded with at once.

New municipal buildings are about to be erected at Richmond, Surrey, and a limited competition for the work is on the eve of settlement. The plans were sent in on the 1st inst. The cost is stated at £10,000.

King's Lynn, Norfolk, has been chosen as the headquarters of the Architectural Association Excursion this year, commencing on Monday, August the 12th.

The new pulpit was dedicated on Thursday at St. Michael's Church, Bournemouth. The design is Early English. The body of the pulpit is octagon on plan, entered by a short flight of six steps from the north transept. It stands on a circular central base shaft and a base arcading. On five faces of the octagon are panels (designed by Mr. W. J. Warren, artist, of Bournemouth), sculptured. The work has been executed by Messrs. A. W. Blackler and Son, of Torquay, and has cost nearly £300. Mr. Reginald G. Pinder, F.R.I.B.A., of Bournemouth, is the architect.

At the last meeting of the Windsor Town Council a resolution was passed that Mr. Thos. Vincent Davison, A.M.I.C.E., the borough surveyor, be thanked for the services rendered by him during the period of the Royal Agricultural Show at Windsor, and that an honorarium of £10 10s. be awarded him for his services.

The Ryde Art Society will open its annual exhibition at the Town-hall, Ryde, on August 1st, under the presidency of H.R.H. Princess Beatrice, who will also contribute some of her own work to the show, which is expected by the hon. sec., Sir William Levinge, to be a very good one. Mr. Drinkwater Butt and Mr. E. Turtle will be the judges in the competition departments.

Clissold Park, Stoke Newington, an area of 53½ acres of wooded and grass land, at present only partially laid out, was formally opened to the public on Wednesday.

On Wednesday week Mr. T. Codrington, C.E., one of the inspectors of the Local Government Board, held an inquiry at Merthyr with reference to an application made by the local board of health to borrow £11,053 19s. 2d. for payment of alterations to Pentwyn reservoir, Neuad reservoir, and other works of water supply.

On Saturday afternoon the Duchess of Westminster laid the foundation-stone of the permanent church of the Holy Innocents, Hammersmith. The cost of the edifice, when completed, will be £9,000, and there will be sitting accommodation for over 800 worshippers. It is intended at present, only to erect the first section of the church, the cost of which will be about £6,000.

The foundation-stone of a mission room which is to be erected at Latchford, Warrington, at a cost of £1,200, was laid on the 11th inst. The room is being built by Mr. R. Beckett, of Hartford, Northwich, and has been designed by Mr. T. Beesley, of Warrington. It is to seat 300 persons.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

ANDOVER.—For pulling down and re-erecting new malt kilns, London-street, Andover, for Mr. F. Bloxham, Andover. Mr. W. Hooker, A.R.I.B.A., London and Andover, architect:—

Cook, T., Andover	£471 0 0
Grace, C., and Sons, Clatford ...	462 0 0
Annett, H., and Son, Andover* ...	435 0 0

* Accepted.

BENTLEY.—For alterations and additions to Mary Cottage, for Capt. W. Collett. Mr. S. Friend, M.S.A., Aldershot, architect:—

Shrubb, A., Bentley	£664 0 0
Kemp, G.	585 0 0
Seabright, J.	582 0 0
Garland, W.	574 0 0
Snuggs, W. J. (accepted)	494 0 0

Rest of Aldershot.

BRIXTON.—For bar fittings, &c., at Hope and Anchor p.h., Brixton, under the superintendence of Mr. W. Eve, F.S.I., 10, Union-court, E.C.:—

Sanders and Son	£434 5 0
Lascelles	360 0 0
Chappell (accepted)	320 0 0

CARDIFF.—For enlarging the Crwys-road School for 300 children, for the Cardiff School Board. Mr. Fawckner, architect:—

Davis, D., Cardiff (accepted).

CARDIFF.—For the erection of a school for 1,080 scholars in Moorland-road, for the Cardiff School Board. Mr. Fawckner, architect:—

Dunn, C. C., Cardiff (accepted) ... £11,030 0 0

CROYDON.—For second portion of contract for business premises, North End, for Mr. J. Ander. Mr. A. Broad, A.R.I.B.A., 27, Dingwall-road, Croydon, architect. Quantities by the architect:—

Smith and Bulled, Croydon £424 15 0

No competition.

DERBY.—For additions to the board school in St. James's-road—providing additional cookery accommodation and places for 118 extra girls:—

Vernon (accepted) £1,750 0 0

DUNSTON-ON-TYNE.—For six houses at Dunston-on-Tyne, for Mr. W. Donnelly. Mr. C. Kempson, C.E., Gateshead, architect:—

Armstrong, W., Dunston-on-Tyne	£1,432 3 11
Noble and Waugh, Dunston-on-Tyne	1,425 11 0
George, E. and T., Newcastle ...	1,390 0 0
Pringle, A., Gateshead	1,315 12 0
Greason Bros., Gateshead	1,310 12 0
McKew, R., Gateshead	1,188 8 0
Briggs, F., Gateshead (accepted)	1,100 0 0
Millard, S., Newcastle	1,072 0 0

EXETER.—For the erection of two houses in the Howell-road, for Mrs. Finch. Mr. C. Cole, Queen-street Chambers, Exeter, architect:—

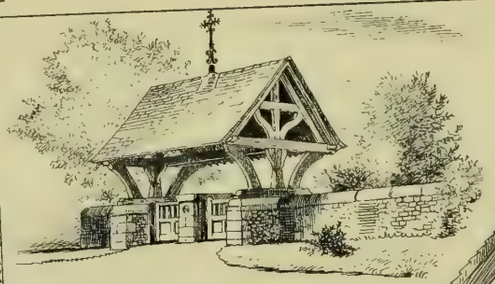
Ham and Pasmore (accepted).
(Six tenders received.)

EXETER.—For alterations and additions at the Eagle Tavern, Howell-road, for Messrs. G. and C. Finch. Mr. C. Cole, Queen-street Chambers, Exeter, architect:—

Westcott, J. (accepted).
(Seven tenders received.)

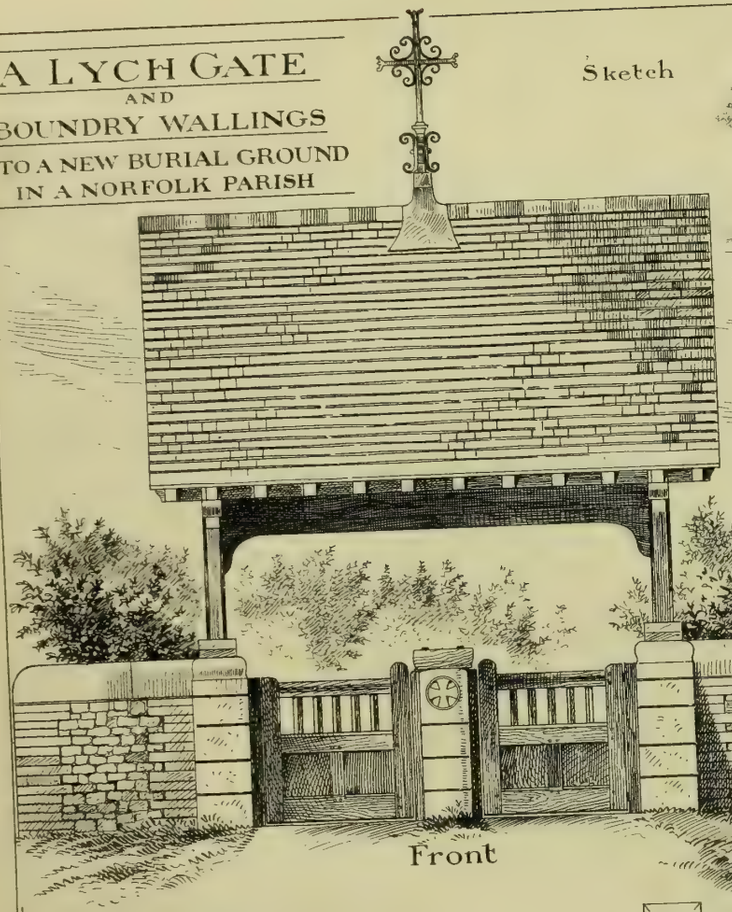
A LYCH GATE AND BOUNDRY WALLINGS TO A NEW BURIAL GROUND IN A NORFOLK PARISH

Sketch

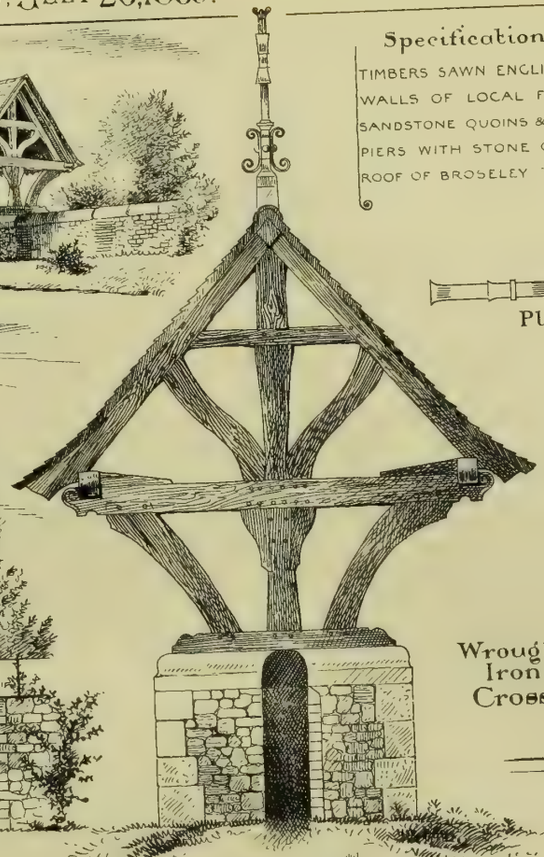


Specification

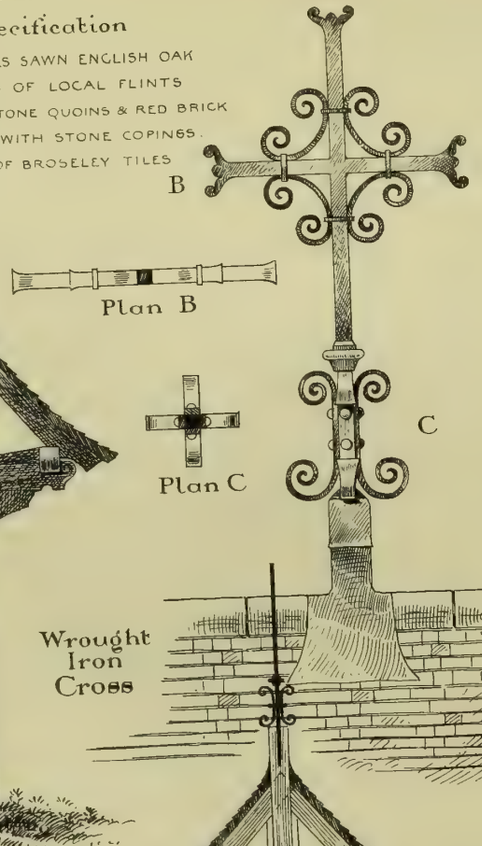
TIMBERS SAWN ENGLISH OAK
WALLS OF LOCAL FLINTS
SANDSTONE QUOINS & RED BRICK
PIERS WITH STONE COPINGS.
ROOF OF BROSELEY TILES



Front



Ends



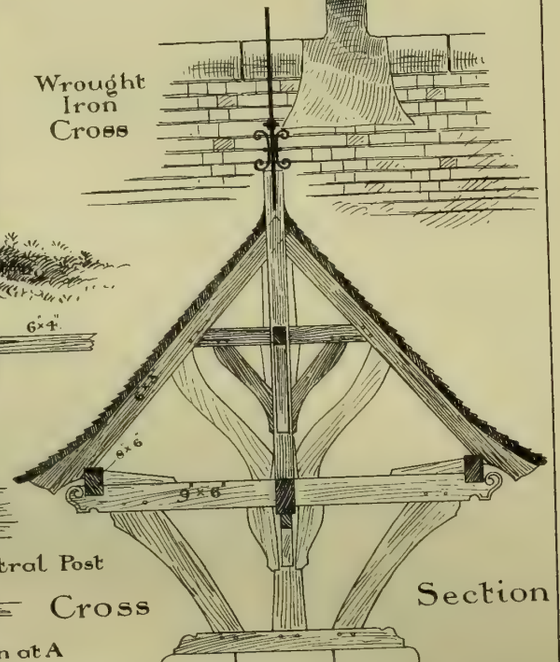
B

Plan B

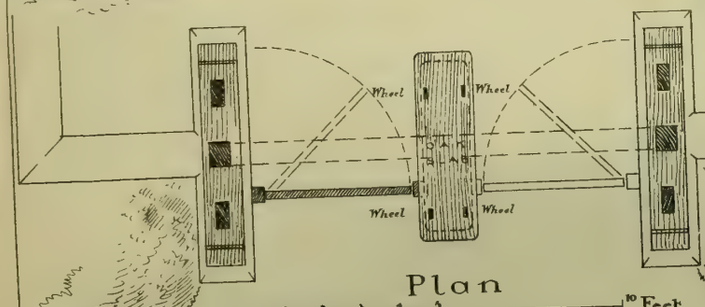
C

Plan C

Wrought Iron Cross

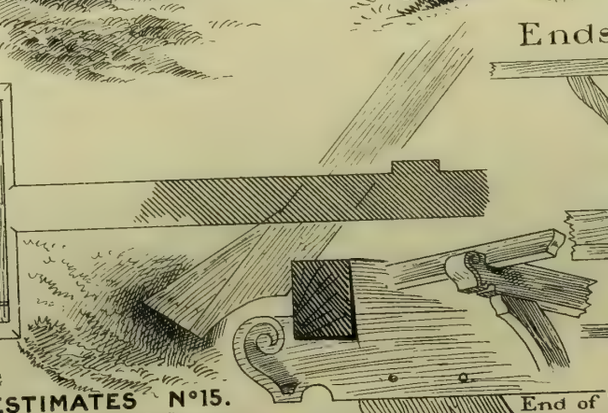


Section



Plan

10 Feet



Central Post

Cross

Plan at A

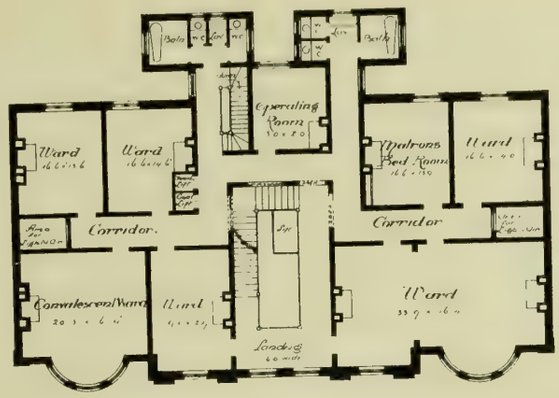
End of Tie piece

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES N°15.

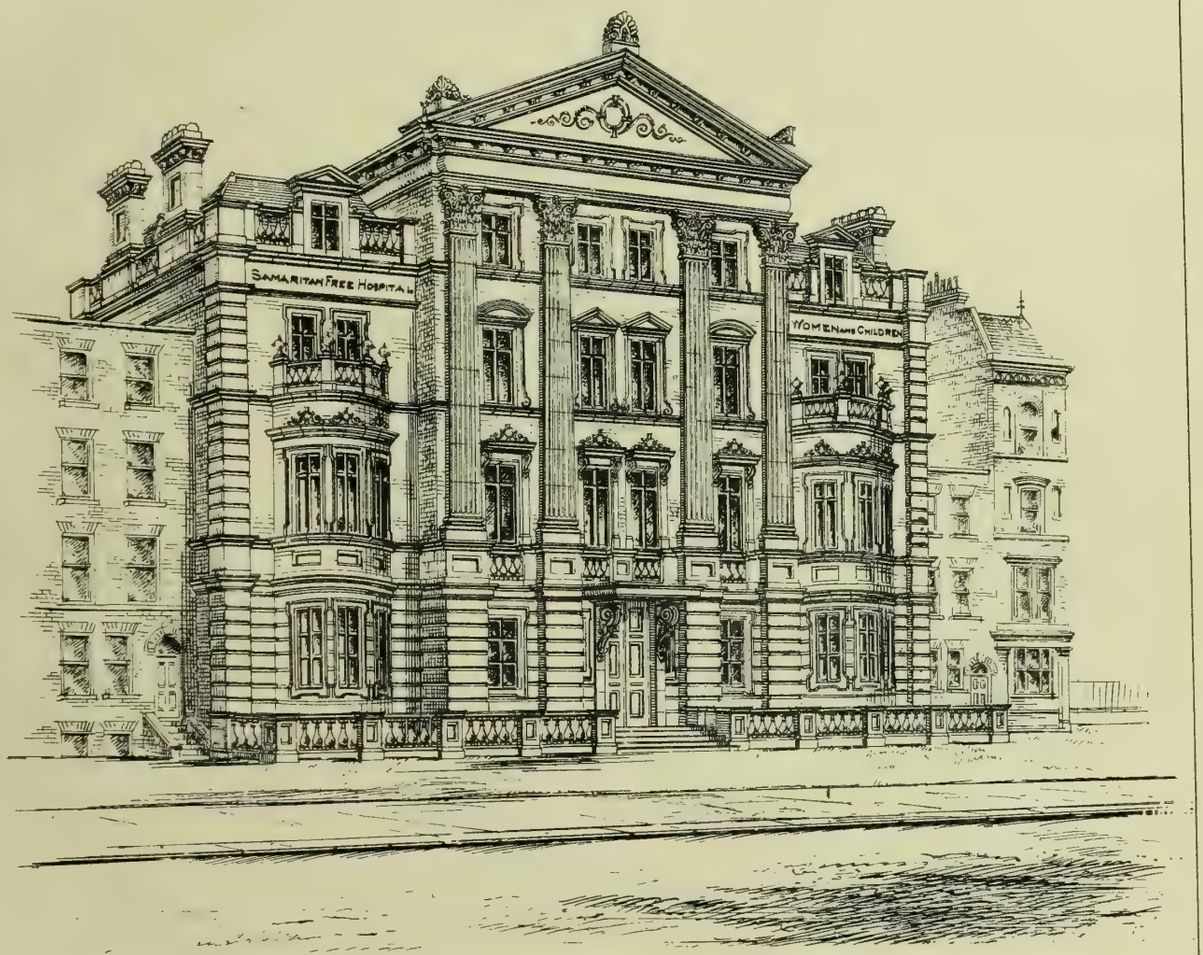
Maurice B. Adams Archt

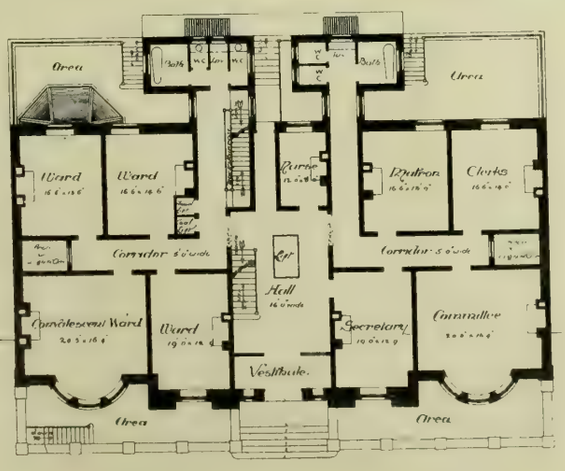
by H. Lovegrove F.S.I. *Surveyor*

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



— 1st Floor Plan —



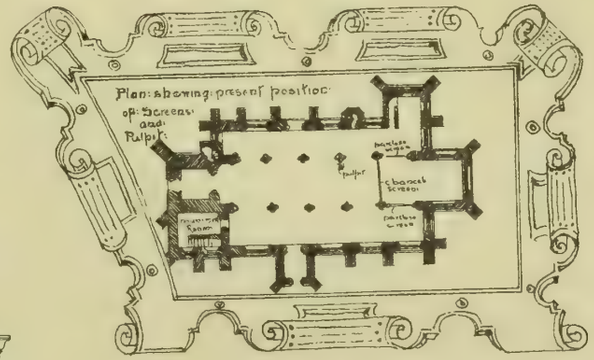


— Ground Plan. —

Photo Lithographed & Printed by James Akerman 6 Queen Square W.C

SAMARITAN · FREE · HOSPITAL · MARYLEBONE ROAD · MESSRS HABERSHON AND FAWCKNER · ARCHTS

Chancel Screen in
Croscombe Church
near
Wells Somersetshire
drawn to the scale of
One Inch To One Foot



Note In order to avoid confusing the drawing the top piece of carving the birds on either side and the Royal Arms above the Vane Elevation only



Half: Elevation: to: Choir:

Half: Elevation: to: Nave:

Measured: and: drawn: by: Arthur: Edward: Bartlett: MDCCCLXXXIX

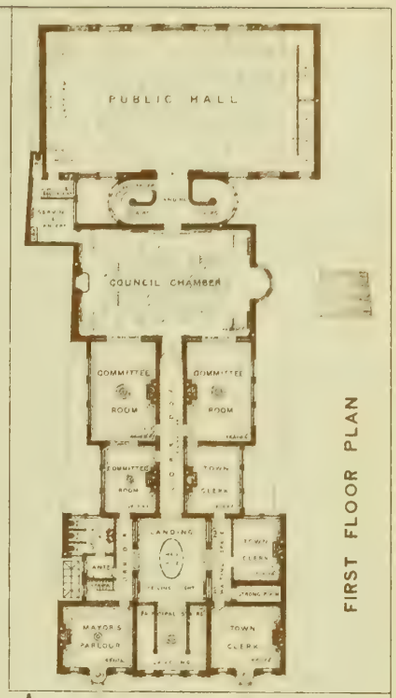
Photo Lithographed & Printed by ... Architectural Association



DESIGN · BY · MESSRS MEDLAND & SON · ARCHTS 2ND PRIZE

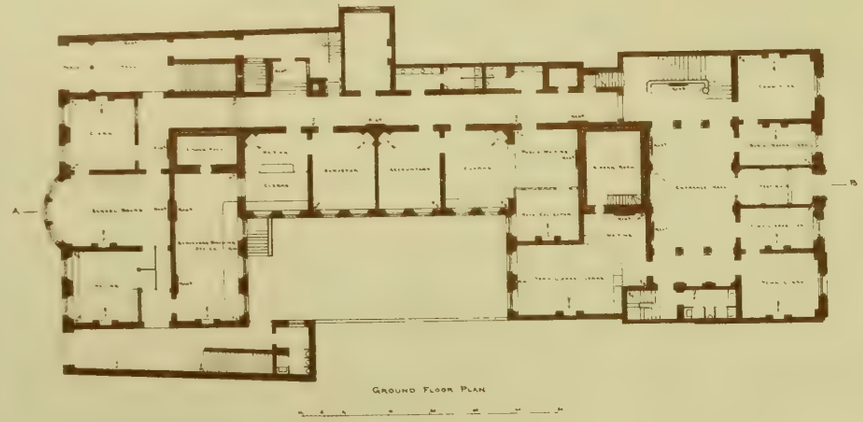
GLOUCESTER · MUNICIPAL · BUILDINGS COMPETITION

2ND & 3RD PREMIATED DESIGNS

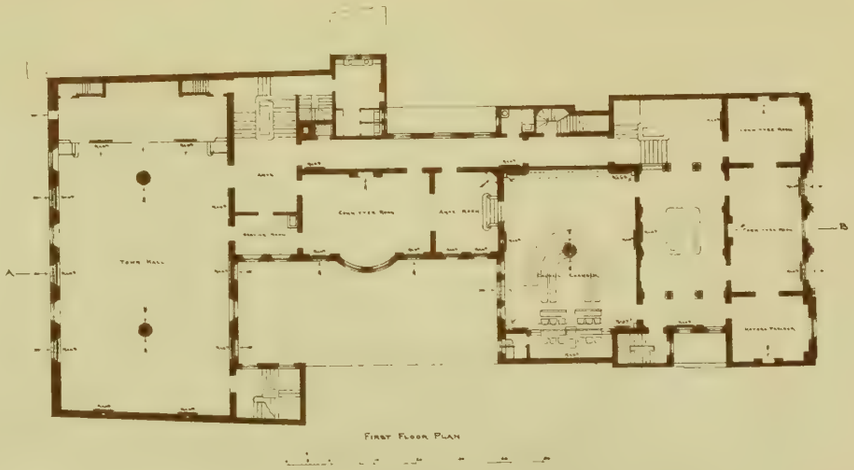


"PHOTO-TINT," by James Akerman, Queen Square

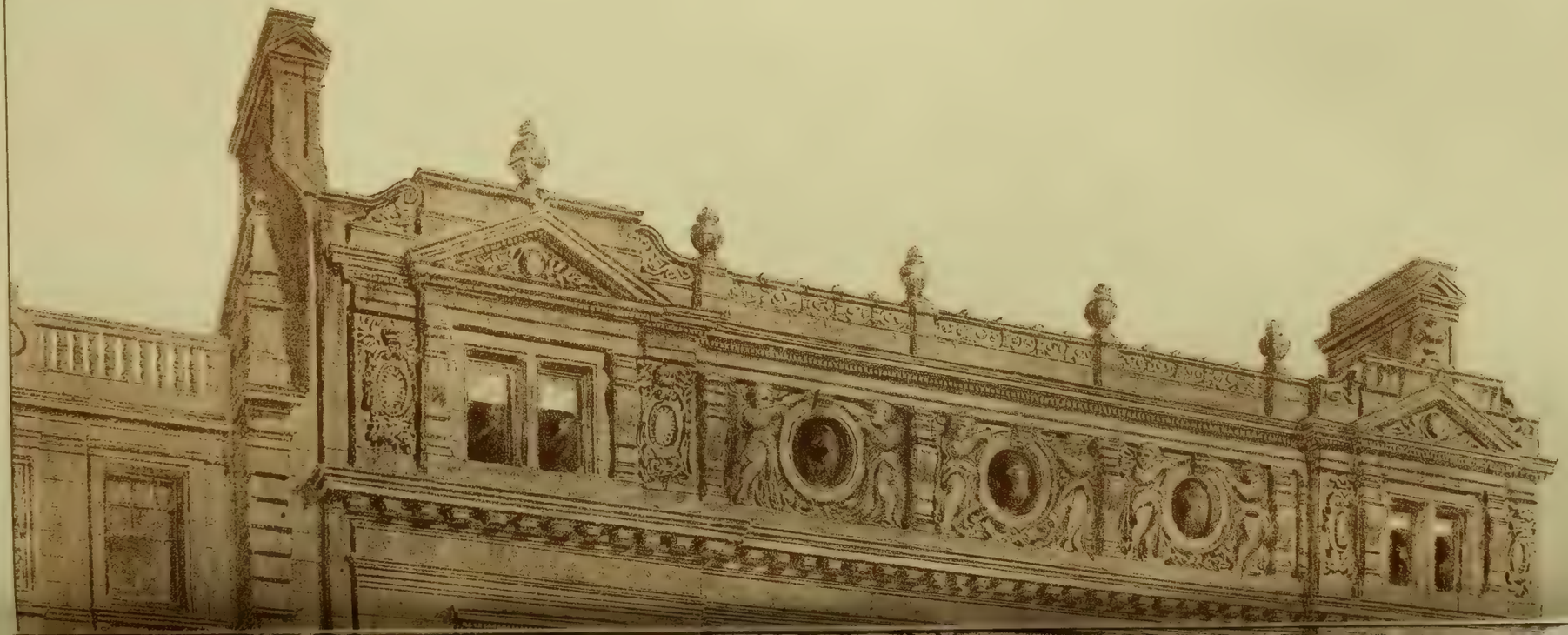
DESIGN · BY · J · FLETCHER TREW · ARCHT 3RD PRIZE



GROUND FLOOR PLAN



FIRST FLOOR PLAN





GLOUCESTER · MUNICIPAL · BUILDINGS COMPETITION

"PHOTO-TINT"

SELECTED DESIGN · BY · G·H·HUNT · ARCHT

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1804.

FRIDAY, AUGUST 2, 1889.

NATIONAL COMPETITION OF PRIZE DRAWINGS.

THIS annual exhibition of the prize work executed in the schools of science and art throughout the country, is one of the best criteria of the art culture of the nation. No less than 60,855 works were sent up for examination, representing 247 schools of art and branch schools, 1851 of which were selected for national competition; 43,927 works from science schools, of which 165 works were selected, and 34,532 from 264 art classes, of which 34 works were selected for competition. The drawings at South Kensington represent, of course, a small proportion of the entire number, and are those which have been awarded medals or book prizes. The six gold medals are distributed to students of the Bristol, Glasgow, Manchester, Nottingham, Stoke-on-Trent, and Wordsley schools, and we are glad to find they are given for stages of the educational code which are of chief industrial importance. Not a single study from the antique obtains a gold medal. The silver medals, 40 in number, are awarded chiefly amongst a few schools. Birmingham receives four, Glasgow four, Hanley three, Leicester three, Manchester six. The latter city stands highest, winning 6 silver medals, 23 bronze medals, and 53 book prizes; and Birmingham comes next. The Cavendish School, Manchester, sustains its reputation for all its stages of design, as well as for groups in painting. As in previous years, elaboration and minute execution have been qualities which the judges of these competitions seem to have mainly had in view. In architectural design, the gold medal this time has been awarded to Henry Littler, of Manchester, for a cathedral church of a Florid Decorated character, and full of the most elaborate detail. There is a tower and central spire at the crossing; this time we are spared western towers. The roof is carried level throughout the lofty nave and choir and presbytery, the former having eight bays, the latter five. The east end is apsidal. Undoubted ability has been shown in the detail and draughtsmanship, and had there been less of the desire to produce a most perfect edifice of the Latest Decorated type, some higher merit might have been apparent. As it is, there is a general elegance and unity in the design.

A silver medal is given for a design for a church, by H. H. Reynolds, Birmingham, in the Perpendicular style, in which there is some creditable drawing. The elaborate tower at the west end is well proportioned: the nave is wide, but the aisles are too low, the windows in the same being almost close to the ground, and betraying a lack of knowledge of good examples. The details are scarcely of the purest type. Another silver medal is awarded to A. Englefield, of the Training Class, for a design for an artist's residence, shown by a rather confused and ill-lighted plan, and an elaborate elevation in a French Renaissance style, very neatly executed, though rather feeble. The design seems scarcely of the character and treatment that an artist of the English school would select for his residence. The planning is wanting in convenience and compactness of grouping. A bronze medal is won by W. Savidge, Nottingham, for a town-hall of Italian design. The plan has a centre public hall and centre tower, and the whole is massively treated, though rather commonplace in detail. Frank Shayler, Banbury, takes a silver medal for a design for a hall and market, shown by a cleverly drawn sepia perspective, in which there are some clever grouping and picturesque treatment. The hall is of half-timber and plaster, supported over an arcaded market with stone piers. The style is Fifteenth Century, and there is a stair turret at one end. The elevations are well and feelingly drawn. A book prize is won by Eric Sutherland, Glasgow, for a design for small Presbyterian Church, of plain stone treatment, with a tower of severe outline at corner, pierced by coupled lancets. The windows are too small. There is no chancel. Another design by G. McIntosh, Glasgow, is picturesquely handled, has more originality, and is of brownish stone with red tile hipped roofs, which are made pleasing features in the design. The plan is transeptal, and better suited for a country service. A tower, the four rounded angles of which are carried up as pinnacles, supports a low, square, tiled roof, piquant in effect. The nave has at one end a large semicircular window. A Renaissance doorway is shown, and the whole is somewhat American in style. W. Freeth, of Birmingham, takes a book prize for a gentleman's house, the design of which is faulty in some points, as, for example, the straggling plan, the very flat-pitched roof, and the chimney shaft, which rises in the centre immediately over a window—wrong in principle as well, as it suggests to the mind want of support. The style is Italian, and the materials brick and stone. The drawing is neat. W. H. Borland's design is Renaissance, with well-drawn details of hall and fireplace, and has some nice grouping; the material is stone. The plan is straggling, and hall too large. The drawings are in sepia, and the work claims a higher prize. W. Grewcock, Leicester, wins a book prize for the same subject in which a Domestic Gothic style is adopted; materials, red brick and timbered gables, boldly treated in the details. A design for a library by Frank B. Cooper, Leicester, Renaissance in style, is rather unpleasing in its general outline and proportions, the red brickwork is relieved by stone in the tower and dressings, and the plan and details have merit, though the work lacks refinement.

A design for public baths, of Classic treatment and with an iron roof, is sent by B. Fletcher, Leicester, and has some good points, though not very artistic. Another book prize goes to a design for Early English gable, by G. McKenzie, Glasgow, well drawn with large octagon turrets at the angles crowned by spirelets; we also notice the same award is given to Chas. Stolle, for a design for a porch and loggia, in light brown ink, neatly drawn, in the Italian style.

The designs for decoration are few. Arthur M. Pearson, of Manchester, wins a silver medal for the decoration of a recreation room, in which there is shown much elegance and refined colour. The wall is divided into three bays by pilasters, the centre being the widest. The frieze of figure subjects is well designed, the wall spaces have panels, and the dado is enriched by festoons. The scheme is Pompeian in style. The terracotta and grey tone of green harmonise well. A book prize is awarded to T. Finchett, West London School, for a similar subject; but the proportion and details are heavy, and a general want of harmony of colour prevails, despite some careful drawing.

The designs for decorative treatment are, speaking generally, without a proper regard to the material and structure—qualities which the examiners have not in all cases considered; in other examples it is but too evident that the motive of the design has been lost sight of, or the lineaments of an original have been copied without the motive, which alone gives to it meaning and merit. We find this the case with some of the designs for textile fabrics, wall-papers, and tiles. The gold-medal design for surface decoration by Maggie Strang, of Glasgow, is unquestionably clever and spirited in conception: the dolphins and seaweed—the latter in bold curves—and the conventional sea which forms a ground to the whole are excellent; but it is certainly not suited for a hanging in which folds occur. The silver medal design for lace curtain by W. H. Pegg, Nottingham, has merit: the spirited foliage and lions of centre, which are involved in a scrollwork ground, are cleverly arranged; but, of course, the design is not adapted for folds. Emily Anderson's (Cork) design (silver medal) is also original and bold; the design is adapted to lace, being a free treatment of foliage conventionally arranged.

We cannot say much in commendation of the carpet designs. The silver medal design (T. Barrett, Macclesfield) is not suited to a Brussels carpet: the lions, panthers, and deer, which are introduced on a red ground, are out of place in the filling, and the blue border not happy. Jessie Keppie, Glasgow, takes a silver medal also for a design for a Persian carpet, of more merit in design and colour, and some good borders. The same award is bestowed on Agnes Farman, Leicester, for a design for stair carpet—a rich tapestry design on dark colouring, though scarcely definite in the pattern. Arthur Morris, Hanley (bronze medal), has a vigorous design for carpet of deep-blue ground. Printed cotton hangings form another section in this class. A silver medal is given to W. E. Holt, Burnley, for a design for a printed cotton hanging. The repeat is not very clear or defined, and the flowers, foliage, and birds, though clever in scheme, too confused; the colouring, too, looks harsh. Herbert Cole's design (book prize) is rather strong in colour. Another hanging design, by R. Sloane, Glasgow—scrollwork and foliage, with apes and tigers introduced—is devoid of adaptation. It takes a bronze medal. Mary R. Curtis, Canterbury, wins a silver medal for a design for damask, displaying considerable skill and chasteness, the design being in two pieces, centre and border. Alfred Palmer, Leicester, receives a bronze medal for designs for Irish linen tablecloths, cleverly arranged in the corners, but rather poor in the centre. A marguerite set of cut-linen lace by W. H. Pegg, Nottingham, is clever. A bronze medal is awarded to May Preston, Blackheath, for a neatly-designed pattern and nice colour for print. A good pattern is shown by G. Griffin, Kidderminster, for a muslin. J. J. Phelps, Manchester, also has a nice design for cotton print; and Mary Dunevin, of the same city, another. Harmony of colour and good design are shown in T. J. Donohue's design for a print.

The wall-paper designs offer no great originality or scope, and indeed show generally a want of skilled adaptation for the purpose. We have already noticed the gold medal design. A bold flower and leaf pattern by Thos. McLoughlin, Manchester, and a design with a pastoral subject by Archd. Walker, Glasgow, are both awarded bronze medals; the latter has dark blue and green in the colouring. A silver medal goes to Herbert Cole, Manchester, for a design with birds and foliage entwined on a gold ground, generally well arranged and filled: the same award is given to Lizzie Girvan, a Glasgow student, for a bold peony design with leaves of a light brownish tint on a warm ground; also a frieze, one of the best arrangements of pattern and colour. Another design, with peacock and foliage in a low key, is striking, and receives a book prize.

In the designs for tiles we do not see many of much merit. Ellen Robinson, Scarborough, takes a silver medal for a set of tiles of a rich conventional arrangement a bronze medal is won by Annie Chrimes, Warrington, for a single combinating 6in.

tile, clever and harmonious in colour; another design, by S. H. Moss, is wanting in definition. In stained glass we must name a classically-arranged three-panel figure subject in a low key of colour, by E. W. Davies, Manchester; also a large figure cartoon by the same artist. A silver medal for a cleverly-drawn figure composition in sienna is won by H. A. Payne, Birmingham, near which is a design for tapestry by F. Mason, of the same city, cleverly drawn.

For wrought-iron gates a bronze medal is won by F. G. Moore, Manchester, for a design of merit; another medal of the same class is given to H. S. Pepper, West London; and the same prize to John W. Ash and R. E. Atkinson, of Leicester, for drawings of gates and grilles. The designs for pottery are not without merit. A silver medal is won by Arthur E. Morris, Hanley, for a design for a plaque with foliage and birds on a deep blue ground; and to Fred. A. Rhead, Fenton, for a majolica dish with figures of three men running and landscape background; the border is pleasing, and the subdued colouring happy. A design for a painted plate (bronze medal) by R. H. Wolff, Manchester, is also chaste in the arrangement of figures and colours. T. W. Holmes, Leeds, takes a silver medal for blue plates, of nice treatment. F. J. Drakes a silver medal, design for a frieze of vase is confused; the figures look jumping and without relation to any motive. A very pleasing design in arrangement of figure and colour is one for a platter and dessert plate by W. G. Townsend, a student of the training class, though it only takes a book prize. The groups of figures in a brownish-red colour on blue ground round the rim are well drawn and in pleasant contrast. William Hindley's design for a plaque, and that of Vincent Bourne, Hanley, are both of merit and in good taste.

The drawings from measurement are not so numerous as we have seen them, and the examples chosen not the best. A gold medal has been won by P. K. Allen, Nottingham, for his very careful and neatly executed set of drawings of Wollaton Hall, to which we have referred when they were exhibited at the Institute. A silver medal is won by McElwee, Londonderry, for a set of well executed drawings of St. Columb's Cathedral, a Perpendicular structure with lofty tower and spire, but a poor example of the style, and with very lumpy details. The drawing is excellent. A bronze medal is worthily given to Harry Hutt, Reading, for measured drawings of Archbishop Abbot's Hospital, Guildford, including a plan of the buildings round quadrangle (not rectangular), the gateway, chimney shafts, details of carved balustrade to master's staircase, and other details, all well drawn in ink. William H. Higginbottom, Nottingham, takes a bronze medal for drawings of the chancel of St. Swithun's Church, Woodborough, an interesting example, including the fine Decorated east window in it. George W. Bugg, Ipswich, sends drawings of Little Wenham Hall, Suffolk, in which the square groined chapel attached to the hall is shown, and the details; a bronze medal is gained. William Fraser, Glasgow, receives a book prize, for a drawing of south cloister door of Jedburgh Abbey, for which the Glasgow Institute avoided a prize. The same prize is awarded to a measured drawing of Malpas Church, Cheshire, by Heber Rimmer, Chester. John Bustin Bowman, Darlington, sends drawings of St. Cuthbert's Church in that town, a sepia elevation of Early English character; and Geo. Gilbert Irvine, Peterborough, the west porch of cathedral of that city. Unfortunately, the porch is by far the least satisfactory feature; the abrupt arch, the awkward curves of the tracery in the upper window, the clumsy buttress gables, make the example not a good specimen of the Perpendicular period. F. Stratton, of the same city, gets a book prize also, for drawings of St. Mary's, Whittlesey. Andrew Erskine, Manchester, for drawings of screen in Croscombe Church, with its quaint carving of Elizabethan character; Chas. Wood, Wakefield, for drawing of an old fireplace at Heath Old Hall in that town with a quaint panel in relief over the mantel; and drawings of an oak chest of drawers and Chippendale chair by F. H. Thompson, Yarmouth, receive also book prizes. We must also notice the shaded ink Corinthian porch by John P. McCann, Aberdeen, and the shaded drawing of south porch of St. Mary's Church, Beverley, by John W. Allison (bronze medal), of Hull, with its details of niche, and its beautifully executed shadows and the shaded drawings in ink of the upper story of the west front of St. Paul's, by C. G. Kennaway and C. E. Webster, of the training class, which receive bronze medals.

Space will not permit us to enter into the other stages of the work done. In the oil-paintings and groups, F. W. Mann, Chancery-lane, Birkbeck School; Minnie Brash, Glasgow; Lehmann J. Oppenheimer, Manchester, and Augusta Schlapffer, of the same place, take silver medals. We must notice in commendation the foliage and flower of hawthorn and chrysanthemum studies in water-colours, by Edward Birks, of Stoke-on-Trent, who takes a gold medal, and the groups of Edith Barrow, Blackheath, the flowers painted in the same medium by W. W. Pilsbury, of Hanley; the monochrome from the antique of Discobolus, by Adam W. Gordon, Edinburgh; the chalk drawings of figures from the antique by Edith Harwood, Bloomsbury, and Frances Ewan, Manchester, all of which receive silver medals. The Birmingham school distinguishes itself for groups in oil and water-colour, and monochrome studies of the antique, for which bronze medals are awarded. The view of cloisters, Norwich, by Ethel Buckingham, and the hall and staircase, by Margaret Holmes, both of Norwich, are well drawn. A silver medal is given to E. Southgate, Perth, for a clever drawing of a ram's head in chalk, and we notice some excellently drawn heads from the antique, for which bronze medals and other prizes have been given; also monochrome studies in oil of ram's head, and oil studies of a woman's and girl's head, by Mabel Hobson and H. Baynes. Robert E. Groves, Leicester, takes this prize for a group in water colours, nice in colour and texture; and Lilian Jacques, Manchester, for a group of water melons and earthenware vases. For delineation of texture and bold execution C. Brockbanks, Newcastle-on-Tyne, chalk drawing of head from the antique, may be noticed; and for refined colour Georgina Bulley's oil painting of head from life—both receive bronze medals. The chalk drawings of drapery arranged on the living model, by Robert E. Groves, of Leicester (silver medal), and one or two others are meritorious. The modelled subjects are equally good. We only notice John H. Parkyn, of Bristol, foliage, which takes a gold medal; A. Young, a model for a frieze. One of the cleverest efforts is by a student of the Training Class, Ernest Fabian, for a model of boy's figure from the nude, simple and graceful in its attitude and treatment.

THE LEASEHOLD SYSTEM, AND ITS ALLEGED ADVANTAGES.—II.

LAST week we referred generally to the recommendations of the Select Committee appointed to inquire into the terms of occupation possessed by occupiers of town houses and holdings in Great Britain, and to the proposed measures for giving leaseholders facilities for the purchase of the fee simple, and we now propose to dwell in more detail upon some of the proposals made, and the evidence that has been elicited in respect of building operations. The evidence given as to terms of occupation and the effects of tenure at Liverpool and the Midland towns like Birmingham upon the working classes is inconclusive. At Liverpool, Mr. Harvey says that the working classes do not own their houses to any extent; but the reason is not difficult to find, the landlord is not found willing to agree to fair or equitable terms, or to consider the claims of the tenant.

The proportion of occupying owners are few in large towns because, first, of the hindrances to purchase imposed by law; second, of the size and cost of the houses, which are often beyond the means of the working man. The leasehold system has created both these objectionable features; it has placed difficulties in the way of purchase, and it has crowded the central parts of our large towns with lofty houses of several floors. Can we wonder, then, that so few of the occupiers are the owners of the houses? The action of building societies has assisted a few to own their dwellings. The evidence of Mr. Rhodes, of Beckenham, shows that in that well-to-do suburb nearly all the lessees are occupiers, except the working and trading classes, many of whom are only tenants. In the case of localised industries, as in the suburbs of large towns, the report says the proportion of occupying owners is large, and the evidence proves that if the freehold could be obtained on fair terms the bulk of such a population would become owners. It is a fact that in many parts of London the lessees do not, as a rule, occupy, the population are mere hirers, and, as Mr. Bourne says: "Where ownership means capital, you do not get the occupier as the owner." These statements are perfectly true, and only prove the rule to what a large extent house-building and letting has become a trade at the cost of the tenant, instead of a spontaneous development based upon the true principle of occupation-ownership. It proves, too, why it is that the working classes at Liverpool and other places do not own their houses.

Why lessees are not occupiers in many instances only proves one of two things—either that the lessee is a speculator, or that he has not found the house he desires under the system. A healthy state of things will only be attained when lessees are occupiers of the premises, and when the middleman ceases to ply his agency. To take some figures, the report says: "On the Bedford (Bloomsbury) Estate, of the better class houses, 380 out of 1,630 are occupied by holders of building leases, and 632 out of 882 by holders of repairing leases (which involve less capital, and have been on the average more recently granted), while of 400 tenement houses let either on building or repairing leases only 100 (or about the same proportion as those of the better class of houses let on building leases) are occupied by the leaseholder. And with regard to Bristol, the same fact is brought out by the evidence of Mr. Josiah Thomas, who states that the larger shops are often owned by the occupiers, the smaller shops seldom, villas in many cases but not usually, and artisans' houses not to any extent." These figures show that on well-managed estates where the houses are substantially built people like to live in them, and that in the tenement class of property there is more room for speculative business and less inducement to occupy.

Another point which the evidence has brought out is mentioned in the report that in recently-built localities where the leases have a number of years to run, the occupying owner is more numerous—a proof, if any be wanting, of the preference given to long tenures. The Committee observe, "When through death, and for various other reasons, town houses change hands, they have a tendency to fall into the hands of investors or middlemen." We have abundant proof of this fact. A large

number of the smaller houses in the London suburbs are in this unfortunate predicament, and are let at exorbitant rents to tenants who are mere ciphers in the hands of the landlord, and who can never get anything done in the shape of repairs. The middleman makes too much out of his bargain to care about selling the remainder of the lease. The Artisans', Labourers', and General Dwellings Company have had to discontinue the selling of their houses to occupiers on the ground that they passed into the hands of middlemen. At Leeds and Wolverhampton, nevertheless, a large number of working men own and live in their freehold houses, according to the evidence of Mr. Fatkin and Mr. Brevitt.

We spoke last week of the evidence for and against the leasehold system, as it bore on building, and maintained that that system does more to encourage jerry building than the freehold. The argument used by Mr. Ryde and others, that on leasehold land the surveyor supervises the building operations, is not borne out by facts, which go to prove that the tendency under that tenure is to get the land covered with houses. The "kind of partnership" to get the land so covered, which is instanced by Mr. Ryde, is one of the leading characteristics of leasehold, though he says it would equally arise on the other tenure. Among the advantages alleged on behalf of the leasehold system, it is said by its advocates, (1) that it not only develops building estates and increases the supply of houses; (2) that the supervision of the freeholder or his agents secures good building; but (3) the estates are laid out with better streets and more open spaces, because larger areas are dealt with at once, and the freeholder, who has an interest in the reversion of the property to his family, exercises more care in its development. We have dealt with the first two of these statements. With regard to the third, we may say that our experience is quite contrary to the assertion that better streets are formed. No doubt more roads are made than are absolutely necessary, to enable more frontage lots to be disposed of; but they are certainly not, as a rule, wide or well made. The freeholder, as the reversionist, has no personal interest in the matter; his greatest interest is to cover the land with houses, and it is equally wrong to assert that more open spaces are left. We can point to dozens of estates near London and other towns where there are no spaces left except those that cannot be developed by building. The Committee, in their report, after referring to these alleged advantages of the good effect exercised by a "far-seeing freeholder" in laying out his estate, say they have, nevertheless, "no evidence to lead them to believe that building land is not *equally well* laid out in the large towns, where the *freehold* system is prevalent, and the evils apprehended from every man building according to his own plan on his own freehold are, in the opinion of the Committee, to be met by the supervision of the local authorities, who should have ample powers to insure both good building and the proper laying out of building land." The above conclusion is reasonable, and needs no comment. The local authorities are the only authorities who should have the control of estate laying out and building.

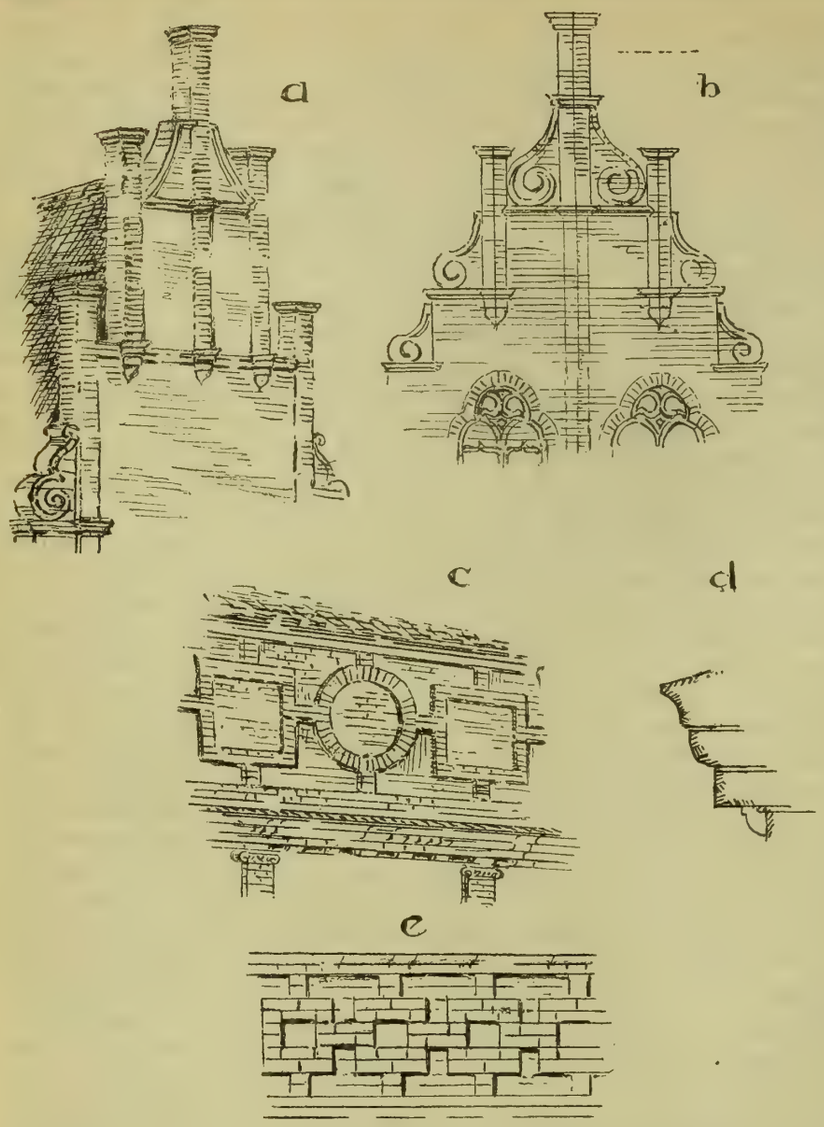
We may now refer to the draft report proposed by Mr. Lawson, and placed second in the Committee's report, as it bears on the questions we have been discussing, and first as to the effect of leasehold tenure upon building. After referring to the evidence of Mr. Vigers, Mr. Martin, Mr. Garrard, and Mr. Boodle, which was intended to show that the abolition of building leases would inflict a serious injury upon the building trade, and would "sweep away the entire class of small builders" by requiring a large command of capital, the report says: "This statement is hardly borne out by the facts of the case. Mr. Boodle quoted several instances from Grosvenor-square and Grosvenor-place, where large profits had been secured by large builders on particular transactions, and Messrs. Cubitt, Smith, and Freake were quoted by Mr. Martin as examples of the success that attends building enterprise under the London system. It was stated, however, by Mr. Holmes that, in consequence of the stagnation of trade, the speculative builder is doing very badly at the present time. The truth seems to be that those builders who have dealt with property of a superior kind in the fashionable quarters of London have made, in many instances, considerable fortunes, whilst the small builder, who has had to pay a high rate of interest for the borrowed money with which he trades, has generally found it difficult to make the business profitable under the present obligation of paying the highest ground rent obtainable for a short lease. As to the construction of houses, the evidence was much clearer and more decisive. Mr. Vigers made an uncompromising statement on the subject. 'My experience leads me to the conclusion that houses built upon leasehold, with the supervision of the freeholder and his agents, are better built, as a rule, than those built upon freeholds, with the exception of large mansions, where a man builds a house for his own occupation,' but the great bulk of testimony points to an exactly opposite conclusion. Among those who supported this view was Mr. Tewson, who said, 'the worst class of house in and near London is found upon freehold building estates.' From our inquiry, it seems difficult to believe that he could find *in London sufficient examples of freehold* to enable him to draw the contrast. As against this, the returns put in by Mr. Harrison show a large preponderance of local opinion in the different towns of England and Wales in favour of freehold tenure as tending to produce sound and worthy building." We have quoted this part of Mr. Lawson's report, as requiring little argument to support it. The italics are ours. The evidence of Mr. Fatkin as to Leeds, Mr. Simpson as to Sheffield, Mr. Wright as to Nottingham, Mr. Burr as to Torquay, Mr. Castle as to colleges at Oxford, the evidence given on behalf of friendly societies, and Mr. Green as to Woolwich, besides others we have already named, are sufficient to support every word of this report, and endorse Mr. Wright's assertion that "the leasehold brings the worst class of builders into the market." With respect to Mr. Boodle's evidence (agent to the Duke of Westminster), the report says it has "not been confirmed by the facts brought before the Committee, for, as pointed out, most witnesses seemed to believe that the power to secure these benefits to the public is *seldom* exercised," confirming what we have already said. According to "Restrictive covenants," under the Enfranchisement system, the report observes the witnesses representing the London Landlords' Committee generally expressed their belief that it would not be practicable; but it was admitted that great laxity had taken place in this respect on leasehold estates. We have no room to refer to the question of compensation. The report thinks that Mr. Lawson's Bill will render the hardships allowed to exist impossible. In addition, the report thinks that a legal right should be given to lessees to the unexhausted value of reasonable and necessary improvements at the end of the tenancy, and in this should be included business goodwill, the tenant only to have this right when he has notice to quit, or when it is proposed to increase his rent, either by annual or capital payment. After summarising the evils of short leasehold, which has been maintained by private Acts of Parliament framed on the lines of family settlement in the interests of the landowners, and which is stated to have led to bad building and to exorbitant costs to lessees, the report goes on to say that life leasehold produced those results in an intensified degree, and that a remedy for these grave evils is urgently needed on the grounds, amongst others, that it is of the "utmost importance to increase the number of owners of property with the sense of responsibility that ownership is shown to inspire in the citizens of other countries and other parts of the British empire." Nor is there evidence to show that London and other short leasehold towns would not have benefited by the prevalence of long leasehold or freehold, as at Manchester, Leeds, or Glasgow. Again, it is justly maintained that the idea of free contract and choice in short leasehold towns is not borne out by the facts, because, if the applicant wants a house or shop, he must either take it under the conditions imposed by the ground landlord or leave the neighbourhood. These conclusions speak for themselves.

The draft report proposed by Mr. Knowles, which follows, is too lengthy to discuss here. It takes the contrary view of the situation, and its conclusions are, briefly, that the systems of building which exist in various parts of the country are, in the main, the outcome of the natural laws of supply and demand; that there is no reason for interfering with the building lease or London leasehold, which has many advantages of its own, and is the most progressive of all the systems of building; that the schemes for leasehold enfranchisement in the Bills before the House are unprecedented and inadmissable, and would stop leasing and raise rents, and, as applied to the past, enfranchise not the occupier, but the middleman, and involve an illegitimate confiscation of property. It is needless to discuss again these views; the recommendations affect corporations, who are to hold as unrestricted powers to dispose of their land for building as absolute owners in fee simple now have; also Dissenting congregations, by enabling them to acquire the sites for places of religious worship, either in fee simple or for very long terms of years subject to provisions. It may be as well to remark that in Mr. Lawson's report attention is drawn to the fact that nearly all the witnesses in favour of short or terminable leaseholds were land agents, surveyors, or solicitors, who had, by their own admissions, a personal and direct interest in that system, while those in favour of enfranchisement were specialists who represented various interests.

ARCHITECTURAL BRICKWORK.—XV.

GABLE AND WALL TREATMENT.

ONE of the distinguishing peculiarities of the gables seen in Dutch and Flemish cities is the stepped outline. Amsterdam is full of examples of brick ornamental gables. In Belgium, also, in Bruges, Antwerp, Tournai, Ypres, and other cities, brick houses with stepped gables are common, and these are either plainly treated, each step having its coping, or the inner angles are filled up by trusses in the manner shown in our sketch elevation of a gable from Bruges. Many of these houses belong to the 15th and 16th centuries, and display very piquant and pleasing details. Within the gable wall, which is pierced sometimes by two or three windows, a variety of treatment is observed. In some examples the piers of the front below are taken up and carried through, or there is a recessed blank arch formed with ogee head in the brickwork, which runs up into the apex of gable, within which is a window or two, as in a house at Tournai, given in Gwilt's "Encyclopædia." In other examples more elaborate design is carried out. The windows have traceried heads, and this sort of blank tracery in



moulded brickwork is made to fill up the gable. A simple and effective treatment is that shown in our first sketch, in which the gable is broken by set-offs, and the angles are relieved by pinnacles or projecting shafts, which are carried through the gable and capped. These engaged shafts are often hexagonal in plan, the triangular portion projecting beyond the face of the wall, as indicated in the sketch. Every set-off is marked by a horizontal string-course, which is made to return or mitre round the shafts, and produce a pleasingly broken outline in perspective. The second example, with console-shaped ramps, is of a more elaborate kind. In each case there is a centre shaft or pinnacle, sometimes carried up from a brick corbel. The effect of these shafted gables is agreeable in perspective; the shafts not only break the flatness of the gable wall, but give strength to it, and enable the horizontal mouldings and copings to be finished against them. In other forms of gable the breaks are filled up by scrolls, or the outline is made up by a succession of curves or ramps alternating. The castle of Fredericksborg and other Danish buildings of Copenhagen are of this form, of which type we will give some examples.

Among the many interesting examples of Tudor brick architecture in this country, Nether Hall, Hertfordshire, deserves attention. The building is not far from Rye House, the details of which we described in our last article; though that mansion is now demolished, the gateway remains. Nether Hall is a fine specimen of brickwork: on each side of the entrance there is a semi-hexagonal tower. Two curious twisted chimneys are to be seen above the gateway, like the shaft we illustrated of Rye House, and a spiral stairs lead to the summit of tower and chimney-shaft. J. Turner, speaking of the brickwork in London of the 16th century, says: "During the reigns of Mary and Elizabeth the ornaments of Roman architecture were frequently introduced in brick or baked clay, which laced the fronts of houses and covered the shafts of chimneys, and continued in numerous fantastical shapes until the reign of James I. (1603). Shortly after they were laid aside. In this and the preceding reign the walling was very bad, being mere rubbish, or even turf or peat between two thin shells of brick. Inigo Jones introduced a better method, of which the piers in Lincoln's Inn Fields are an excellent specimen; and Sir Richard Crispe, the patriotic friend of Charles I., is said to have been the inventor of the art of making them as now practised." The same writer goes on to say: "The method adopted principally in these ages of building with brick was in what we now term 'English bond,' which was certainly well understood, but about the time of James, and for a long period after, a very careless method of erecting walls with brick began and continued; and although much is attributed to its perfection in the days of Inigo Jones, it does not appear, upon examination of several old buildings, that it was thoroughly understood and appreciated until some years after." The brick-building era properly commenced after the Great Fire, when Wren and his successors left us some of the finest specimens. Turner says, as "far as regards neatness of workmanship, the entrance to the Middle Temple and several fronts of houses about the City and West-end are excellent examples." The method styled Flemish bond was then introduced. Those who wish to study examples of the more modest kind of brickwork will find Surrey full of interesting examples, especially Guildford, Godalming, and Unsted. The noble chimney-shafts of Abbot's Hospital, Guildford, and the diagonal and star-patterned shafts found in many of the old farmhouses and cottages in the county; the gable treatment of houses found in the same town, and at Godalming and Farnham, are full of interest. Our other sketches, *c*, *d*, *e*, represent two simple modes of wall enrichment which are adapted for bands or friezes.

"BUILDING NEWS" DESIGNING CLUB.

A COCOA HOUSE.

THIS is the last subject for the work of our club this season, and we publish to-day the two chosen designs, "D." in a circle being placed first, and "Judge Pitman" second. According to our custom, we give here the conditions issued to competitors.

A Cocoa House and Vegetarian Restaurant for a Small Country Market Town. The site to be situated in the main street, and to measure 80ft. deep, with a frontage of 40ft. The two entrances to be from the front—one to the administrative part of the premises and one to the business portion. A roomy back yard for light and air is to be contrived. In the basement a good cellar is to be arranged, with coal place and larder, knife-cleaning place, &c. The ground floor is to be entered by a screened lobby, with a public bar counter in the hall for light refreshments; leading out of this hall a small smoking-room is to be arranged, and also the principal dining-room. On the first floor a second dining and tea-room is to be provided, with a billiard-room off the chief landing. On the ground floor, or off the half-landing of the principal staircase, a gentleman's lavatory, with two w.c.'s and a double urinal, is to be introduced, and a similar convenience for ladies is to be approached from the first floor. The kitchen may be at the top of the house, where rooms for the caretaker, comprising living-room and three bedrooms, are to be situated, divided off from the kitchen offices. One of these bedrooms is to be suitable for two female servants engaged in the work of the restaurant. A back staircase is necessary. Style to be English Renaissance, in red brick with stone dressings. A projecting clock from the front of the cocoa house to be made a feature of, with the words "The Clock House" introduced in the wrought ironwork supporting it. The adjoining premises to be reckoned two-story ordinary street houses and shops. Scale, 8ft. to the inch. Elevation, section, and plans, with small key sketch.

By turning to the prize plans, it will be seen how these stipulations have been worked out. "D." in a circle certainly is the best, though the feature made of the servery and bar near the lifts in "Judge Pitman's" design is a point of no mean importance. In detail, however, his arrangement here is crowded, and not really so good as it would seem at first sight. "D." in a circle gives us a roomy building with ample hall and landing, contriving a separate service staircase from top to bottom of the house with good light and a private entrance. The bar seems perhaps a little too isolated, though it would not be a great difficulty to form a lift down from the top landing outside the kitchen to this bar. The pay hatchway seems to be placed just where a buffet ought to come, and we question if the hatch would be used. The servery is a little too confined, and we notice that the door to it is not dotted in. That from the smoking-room would be awkward coming against the sink, which is not well situated for washing glass. The dining-room has all the light at one end, which is not an advantage. The first floor is nicely set out, but we should have liked a section through the stair-

case showing how the lantern light works in. On plan it seems rather odd. The elevations are very nice. The bedroom fireplaces in the angles come over a void, though possibly an iron girder is intended? Yes, but that is very questionable construction, and the objection is a very practical one. There is no door shown into the yard, which is an oversight. "Judge Pitman" dodges in a chimney much in the same way as "D,"—over a wall it is true, which might measure 9in., but it looks a rare good chimney-shaft in the view and on the elevation. The men's lavatory is too confined, and in much too public a position. The billiard-room is badly lighted, and the fireplace ought to be recessed as it is in the selected design. The second dining-room on the first floor is needlessly large, and the servery lobby in both rooms looks crudely arranged, while we cannot say we approve of the outer wall above the upper dining-room being carried on girders and the stancheon. Of course it can be done, and is done every day; but in this case there ought not to be any occasion to adopt such a style of building. A scullery should adjoin the kitchen. We fancy that the elevation is a trifle too ambitious, and is cut up too much in parts. Otherwise we admit the picturesque effect of the façade. "Zodiac" is the motto of the design placed third. His elevation pleases us more than his plan. There is a commonsense treatment about it which in ordinary work finds favour, but there is likewise a marked absence of "go" in the design. The plan is roomy, and the service is fairly well considered, but we do not like the bar and staircase quite, although it looks fairly practical. "Fairy's" elevation is too much like a bank, or perhaps an insurance office; but his plan is very good, excepting the lavatories, which are about as bad as bad can be. The upper dining-room has no fireplace in it, and the flue from the smoke-room gets very quickly into the shaft over the lower dining-room fireplace, even though the pitch of the ground-floor rooms is unusually high. The perspective sketch is prettily done, and is not too big. "Triangle in a circle" ranks next, with several good points about the design, and a very ingenious plan indeed; the latter is better than the elevation, which is too cut-up to be really good. Thus, for example, half the façade is furnished with a massive stone-built balcony, and half with a light open wooden one. The small gable, with blank wall space below, from which the iron clock projects, is a nice idea, giving point to the composition, and showing that the author has good taste and forethought, seeing that ample room is allowed for the weights, &c. The flues, built up from the foundations, and the general arrangements, leave little to be desired. The design is certainly the best which we remember from this contributor. We miss a proper section. "Abacus" draws neatly, and does not plan badly; but there is a wide gap between the merit of the designs already named and this one. The hall is wasteful, though the administrative part of the arrangements are fairly well considered, notwithstanding that the lift should not work from the scullery. Either it should descend from the kitchen or from a lobby leading out of it. A scullery is usually a wash-up place. The elevation of this design is comparatively poor, and you could not build an arch into the adjoining house, as "Abacus" proposes for his side entrance. "Wallaby" studies American buildings and style of draughtsmanship, and we do not blame him for this, seeing that our friends across the Atlantic in many ways take a lead, and show much ability and originality in the clever way in which they design their buildings and draw them for illustration. "Wallaby" copies, however, their faults, and so produces a restless, fizzy sort of building, too busy to be admirable, and marked by a straining after quaintness. One instance of what we mean must suffice—viz., the arcaded row of lights under the projecting gable, quite cutting the façade in two. These windows, it is true, come into the billiard-room, but being set back under the oversailing gable would hardly give much light after all. The service portion of the plan is good, but the hall is too big and wasteful. "A 1" is commonplace, and gives us just the style of thing which is too frequently adopted in our country towns under the name of modern improvements. We do not say that it shows what to avoid exactly, but it suggests the thought so often forced on us when travelling about—viz., that it is only a slight mercy the design was not worse. As it is, there is nothing to admire beyond the fact that the composition is not vulgar. The plan is small in its general idea and the scale of its rooms. "Stanley" is better in this respect, but his elevation exhibits a want of knowledge of architectural detail. The plan, too, is crude, though it has clever parts, such as the bar arrangement in the hall, despite the fact that even this suffers from want of study. The customers standing in front of it would either crowd each other or impede the way to the dining-room. The cleverness to which we refer is the way in which the lift and service at this point come in for the counter-work. For the dining-room use the lift is too much cut off, however, by the bar, so that, on the whole, the contrivance is not thought out as it might have been. Transpose the position of the lift and the thing is complete. "Vorwarts" makes his building too grand in style, and it is also incongruous in itself. Thus, to speak in detail, the trade entrance, by being situated where it is under the main gable and by the side of the big window, looks as if it would easily be mistaken for the principal doorway. The plan is poor and wasteful. "Renaissance" is of a cast-iron type of work indifferently thought out with a crowded plan and fussed-up elevation. The author has, however, done his best, and in time will do better. Let him study good examples, and try again. On no account give up trying.

SOME HOLIDAY NOTES.

IN these days it is a relief to get away for a month from the sound and sight of a railway. That, at least, is my experience, and as this is the last day I shall spend upon the P. and O. steamer *Massilia*, ere stepping ashore with face turned towards home and hard work, I have just looked over my notebook, and marked a few paragraphs that may possibly interest the general reader.

Here they are: One arrives at Gibraltar after a pleasant voyage of five days from Tilbury Docks. From an archæological point of view the remains of an old Moorish castle that stands out boldly some distance up the Rock near to the north mole, is the most interesting feature. It is said to have been built by Tarif-Abu-Zara, the Moor, who, in A.D. 710, crossed from Ceuta in Africa, and took possession of the great limestone rock on the Spanish side of the straits. From him it first took its name Gebal-Tarik, afterwards corrupted into Gibraltar, and from this fortress the children of Allah swept all over Spain. Only a portion of the castle remains; but its obtusely-pointed arches are probably the oldest in Europe.

The Cathedral at Gibraltar is dedicated to the Holy Trinity. It was built about 60 years ago, and one evening I found the grave of its "architect and builder" (so it was inscribed) away in a shady, but apparently almost forgotten, little cemetery, close by the Barrack Stores Department on the road to Europa Point. Designed in the Moorish style of architecture, Gibraltar Cathedral is probably the ugliest in Europe, and so, out of respect for the dead, I forbear giving the name of its original conceiver.

Talking about cemeteries, the large one on the North Lines is of some interest; but the early age at which so many people die in this part of the world suggests serious consideration. The local statuary's art does not seem of a very high type. A large Celtic cross in native sandstone has just been erected. The inscription says:—

"By the members of the Talpe Hunt to the memory of the late Richard Holmes, Esq., a supporter of the Hunt for the last 35 years, who was drowned at Washerwoman's Ford returning from hunting on the 6th of April, 1888. Aged 76 years. R.I.P." It is the roughest specimen of monumental work I ever remember seeing in my life.

Near this cemetery is a solitary statuary's yard. Its owner makes the following announcement upon a board:—"Marble and all kind of gravestone don here, and letters of every description.—J. Martiney."

A new battery is building on the heights, but the public are not allowed up, possibly so that they shall not realise to the full what a farce it is to say Gibraltar is the key to the Straits. As a harbour, and as a place for stores, and as a refuge, it is excellent; but its guns could no more stop a fleet going in or out of the Mediterranean than the big cannon on Shakespeare's Cliff could hit a ship on the French side of Dover Straits. At Gibraltar it is fourteen miles across to Ceuta on the opposite side, and the guns we have at present of course won't carry anything like that distance.

There is a lot of house-building going on in the town at Gibraltar just now. The bricks used are, to English notions, more like tiles. They measure about 11in. by 5½in. by 1¼in. Walls are built of these, and are invariably stuccoed outside. At the corner of Well-lane, and opposite to the Post-office, a new job has just started. The limestone base (tooled, edging, and rough-hammered on face) is fixed.

The garrison library contains 40,000 volumes, and is well worth a visit. The old engravings there of Gibraltar are exceptionally interesting. The principal English papers are taken in; but the only one on things architectural is the Building News.

Algeciras is a Spanish town, on the opposite side of the Bay of Gibraltar, and four or five miles from the Rock. The wrought-iron work, protecting almost every window and supporting verandahs and water-shoots, is an especial feature, and worth notice. The metal work is invariably painted green. Outside the town there is an old aqueduct, generally supposed to be of Roman construction. It still supplies the town with water, and spans a deep valley, perhaps a quarter of a mile or more wide. The piers are very slight, and remind one of Brunel's at Saltash Bridge. I mean the piers over and above the little Cornish town of Saltash. The actual shafts are only 3ft. 8in. square, and the bases are generally 4ft. 6in. square; but at the bottom of the valley, and near the bed of the river, the bases stand on plan diagonally, and are 10ft. square. Here and there are buttresses of solid masonry, giving additional strength to the piers, and in several places there are buttresses. The piers are of stone, in beds generally about 1ft. 8in. deep. The arches to the aqueduct and flying buttresses are of tiles (11½in. by 5½in. by 1¼in.). The top is only 2ft. 6in. wide. The watercourse is covered (circular). All the putlock holes are left.

At present the nearest railway to Gibraltar is near Cadiz, more than fifty miles away. A new line is in hand, however, through to Algeciras. Some Englishmen, with whom I dined at the Hotel Marino (an hostel opposite the sea, and containing some quaint old Moorish work), told me they were connected with its construction, and that it was expected to be finished in three years.

Tangiers is only three hours or so by steam from Gibraltar. Morocco is a queer land; it is said there is not a wheeled conveyance in the whole country, not even a wheel-barrow. There are certainly no roads; the one between Tangier and Tetuan, connecting, for instance, two of the oldest cities in the world, and a distance of nearly 50 miles, is nothing but a mere track through valleys and over mountains. I happen to know this to my sore discomfort, for the first mule ride I ever ventured upon in my life, was a fortnight ago, from Tangiers to Tetuan and back, and I bear honourable scars, the outcome of that experience to this hour! A large bank is at present building at Tangiers in the principal street, if at least one may call a narrow, dirty, ill-paved thoroughfare as it is, by such a name.

Outside the town, going down towards the beach, some good buildings are in course of erection. Labour is cheap, but materials dear. The same narrow, tile-like brick is used, and all the walls are thickly plastered. Now that things are getting warm at Monte-Carlo, speculators are turning their attention to other places. A week or two ago, an hotel on the sands at Tangiers—a recently built one—was sold for 30,000dols. (something like £6,000) and, 'tis generally affirmed, will be shortly opened as a gambling-house.

Tangiers faces the Atlantic, but Tetuan is a few miles inland from the Mediterranean Sea. The latter is hard to get at, and not often visited. During my few days' stay at the one solitary hotel that "infidels" are allowed to sleep at (Nahon's Hotel Anglais), I was the only Englishman in the whole place. The Moors here are exceeding clever with the hammer and anvil. All the windows contain wrought-iron work, so that for this class of labour there is a large local demand. There are several new houses in progress in Tetuan, and some additions I went over that are being made to an opulant Moor's residence, were very instructive. The bricklayers were all patriarchal-looking, long-bearded, grave-faced

men, dressed in flowing white robes. They sat upon the soles of their feet and buttocks to lay the bricks, and each had a couple of black slaves, as labourers, to wait upon them. The bricks were similar to those already described, and, with the mortar, were brought through the tortuous streets and to the foot of the scaffolding on the backs of asses. I noticed that the bricklayers plastered their walls at the same time that they built them up. The new wrought-iron screens and gratings for this house are all particularly excellent examples of modern smiths' work.

I mentioned the slaves doing labourers' work! Slaves are plentiful in Morocco, and seem the happiest part of the population, if one may judge by appearances. The Moors are all handsome, sombre, and morose-looking; the Jews have the appearance of frightened sheep; but the slaves are black, perspiring, and smiling, wherever and whenever you see them. They are not expensive. A strong young man may be bought for from £14 to £21, and I had my pick of a bevy of pretty black slave girls offered me for £20.

The pottery that is made at Tetuan and Tangiers is exceeding good. The potters burrow in under the hill sides, raise the clay, make and burn their wares, and live in tents or huts close by. The old Moorish remains at both Tetuan and Tangiers are numerous and very interesting. The lower part of the town of Tetuan is in ruins. This portion was destroyed by the Spaniards in the war of 1859-60, and has remained in precisely the same state ever since.

Ceuta is in Barbary on the north coast of Africa. It is a strongly fortified Spanish penal settlement. It is a difficult thing to get to Ceuta, even from Gibraltar. A passport and permit are necessary, and these secured, one only gets there by first taking a steamer to Algeciras, and a second to Ceuta itself. There are about 4,000 convicts at Ceuta; but the discipline is lax, and at least half of them work about the town on ticket-of-leave. Two new forts are building just now, to protect three or four monstrous great cannons already in position. The barracks in which the 44th regiment of foot (Spanish) now lie, are being rebuilt, and when completed will be of immense size. Designed by the military engineers, the The works are being carried out by convict labour. base all around is of stone, the rest is built of the narrow brick of the locality duly plastered over.

One sad story and I have done. Yesterday (Friday 29th July) up till 10 a.m., a smart Hindoo sailor (we have nearly 100 of them on board) was on deck about his work in the usual way, when he suddenly went forward into the blacks' quarters, and lying down, complained that "the devil had touched his stomach." By 4.30 p.m. he was dead, and at 7 o'clock, wrapped in a large white cotton sheet, his fellow Mussulmen brought him tenderly up the hatch in some matting, and laid him on a wooden grating. Bars of iron were fastened to his legs, he was let gently over the ship's bows, and just as the sun dipped its golden head on the distant horizon, one end of the grating was let go, and the still limp corpse slipped quietly into the water. The fine young fellow of 23 years of age yesterday morning, was actually dead and buried by sundown the same evening.

There! I have come to an end of these notes, so I have of my month's holiday, and so too—very nearly—of the £30 provided for the expenses thereof.

Harry Hems.

CARPENTRY AND JOINERY.—XX.*

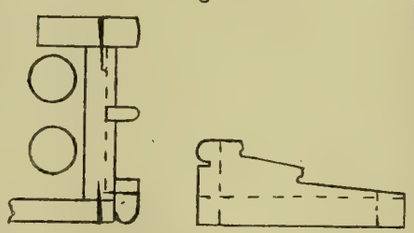
WINDOW-FRAMES AND SASHES.

THE window-frame and sash in almost universal use throughout these three kingdoms, and in many other parts of the world, is that in which the weight of the sashes is counterbalanced by metal weights, which slide in a boxing prepared for them, and move in an opposite direction to the sash to which they are attached.

Fig. 141 shows a section of the *pulley stiles* (the head of the frame is usually of the same section), and also of the sill of one of the commoner kinds of these frames. Diversities and elaborations will be described further on. Now, to set about making a window-frame of this description, the first thing to know is the size required. If the building is already up, and the sills (stone or other material) already *set*, then the sizes may be taken either with a lath or measured with the rule; the size to be taken is the *daylight*—that is, between the *reveals* (outer jambs) for the width, and from the sill to the inside of the top reveal. In Fig. 141 the underside of the sill is shown level, which is for the case of a stone sill *weathered* from the line of the sill of the window-frame outwards. Having the height and width, the workman proceeds to set out or lay down the lines of his intended frame on a board.

Fig. 142 shows how the width is arranged—that is, as is seen, the inside of the *pulley stiles* is made the width of the open which was taken. This is in the case of stone reveals or clean finished brickwork; but if the reveals are to be cemented upon the top of the brickwork, whether only the reveals, or if the building is of rough brickwork to be cemented all over, then an allowance of from ½in. to ¾in. must be made on each side (according to the coat of cement which will be put on)—that is, the frame will be 1in. or 1½in. narrower than the daylight when the cementing is completed. In other words, the frame must be made to the daylight of the finished cement. The height taken is the length from the underside of the sill of the frame to the inside of the head; or, if the reveals are cemented the same rule applies at the top as to the width. Having then laid down the height and width of the frame, the next business is to get the lengths, breadths, and thicknesses of the various pieces of timber required, which is taken from the setting out on the board (plan and elevation full size). Sometimes templates or section moulds are made of veneer to the section of each part—that is, of the pulley stile, outer casing, inner casing, parting bead which divides the sashes, and for which

Fig 141



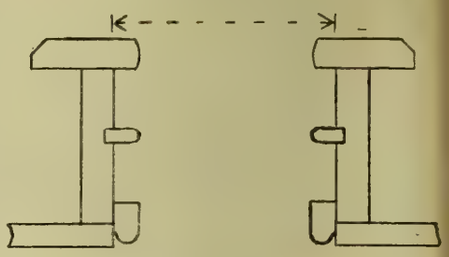
2" Scale

the pulley stile is grooved, and staff bead or batten slip which serves to keep in the inner sash. Perhaps a word of explanation is needed about the sizes of the timbers required for these several parts. Outer casings are generally 1in., inner casings ¾in. or 1in., pulley stiles from 1in. to 1¼in., and in extreme cases 1½in. Sashes are generally 2in. thick, thus serving as a guide to know the breadth to make the pulley stiles; these must be wide enough for two sashes 1/16in. or ½in. for parting bead, and, say, ¾in. of allowance for batten slip, another ¾in. being obtained by the thickness of the inner casing, which is nailed to the edge of the pulley stile (batten slip is usually 1½in. broad at least, except in very inferior work). Having then obtained the timber required for the frame, and of the various dimensions needed, it is planed up; this, in the case of a *machine shop*, would be done by the machines, all being made ready for them to the proper sizes and sections. It will be noted that the groove in the pulley-stile is arranged according to the thickness of the sashes—in this example, 2in., that is, the measuring from the outer edge of the pulley-stile, 2in., then allow for groove to suit parting bead.

In setting out the pulley-stiles for the axle pulleys, they must be set out to match each other (paired); this is required also to suit the *pockets* (these are for the purpose of getting in the weights).

Fig. 143 shows the provision for axle-pulleys—viz., mortises—which are usually about 4in. or so, from the inside of the head to the top of the mortise, and the mortise is in length to suit the axle pulleys. These are classified according to the diameter of the wheel or sheave, 1¾in., 2in., and 2¼in. being common sizes. Axle pulleys are of many varieties, the better kinds being made of brass. They are sunk in the pulley-stile until the plate is flush or fair with its surface, and then screwed; but the *pocket-pieces* are let in and grooved before this is done. Pulleys are let in as follows:—The mortise should be of sufficient dimensions to let in the wheel and its guards; the pulley is then dropped into the mortise, the plate resting upon the pulley-stile. If the edge of the plate of the pulley is parallel with the edge of the pulley stile, then mark round the edges of the pulley plate with a *draw-point* carefully, which is the line of sinking, and inside these lines should be taken out to a depth equal

Fig 142

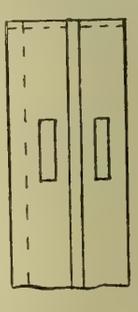


2" Scale

to the thickness of the plate. An *old woman's tooth* or *router* is used to sink this parallel. The edges of the pulley plate being slightly bevelled, it tightens as it goes in. The pulley should be put in to see if it fits well, and is perfectly fair with the surface of the pulley stile before being screwed; if it is sunk under the surface a shaving or piece of old glass paper may be put under the plate to pack it up level, but with care this can be avoided. If, when the pulley was put in the edge of the plate was not fair with the edge of the stile (parallel) it should be made so before marking for the sinking of the plate. No casing lines are shown in Fig. 143; so as not to confuse, the groove for the parting bead is seen, and a dotted line across at the upper end shows the distance which the pulley stile enters the head.

Fig. 144 shows a front and edge view of a pulley stile at the *pocket piece*, to show the manner of its insertion. It may be here stated that it is not always so situated, but sometimes reaches from the outer face of the *parting bead* to the inner edge of the pulley stile; but this method weakens the stile more than the other way, as shown in Fig. 144, and is not so suitable for nailing the inner casings, as no nail can be put into the pocket piece, seeing it requires to be taken out should a cord or other material used in suspending the weights break. In a machine shop one method of cutting out the pocket pieces is by lowering the pulley

Fig 143



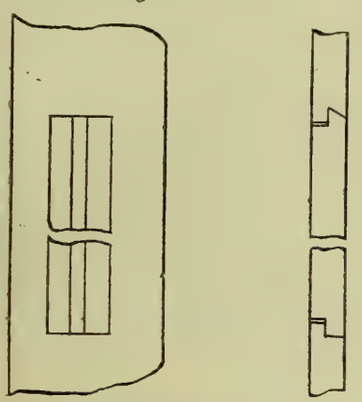
1½ Scale

stile on the circular saw and putting in two cuts the requisite length and at the proper place (gauge for them), and then cutting out the piece endwise with a chisel, or boring holes and cutting it out with a table, lock, or compass saw. The length of the pocket-piece is arranged this way: it is not allowed to reach up so high as that it could be seen above the *meeting rail* of the sash, and should be, if possible, 10in. or 12in. above the sill of the frame—that is, it may be the length of the bottom sash, less 13in. or 15in. In very

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short frames the *pocket* reaches much nearer to the sill, as, of course, the *pocket* must be long enough to admit of the weight being readily got in. The breadth of the pocket-piece should be a little more than the diameter of the weight which is to pass through—usually from 2in. to 2½in. When the opening is made, a piece is fitted in and the edges of the stile are straightened, and then if the stiles have been grooved only the *pocket-piece* is grooved; but it is even better to delay the grooving until the pockets have been fitted. It will be seen that the parting bead keeps in the pocket-piece by this method; but if the other method is adopted, a screw should be put in to keep in the bottom end; the upper end is kept in position by the bevel of the sinking.

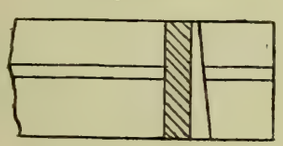
Fig 144



2" Scale

The pulley stiles are cut square at each end, and of the necessary length. Dotted lines (horizontal) are shown in Fig. 141, which give the depths of the sinkings, and also serve to indicate the length of the pulley stiles on the elevation. The sill and bead are sunk for the pulley stiles, and the sinking may either be so as just to admit the stile alone, or, which is more customary, sunk for a wedge or key, in addition to the thickness of the stile. This sinking is termed *trenching*.

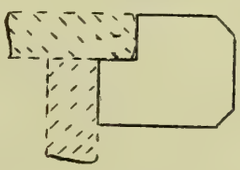
Fig 145



1½ Scale

Fig. 145 shows the method of keying in the pulley stile in the head; the pulley stiles have sectional lines drawn across, and the wedge or key is shown. The sill is done in a similar manner, and, of course, they must be to match, so that the proper edge of the sill may be out when the frame is put together. (This matter of matching or pairing it is very essential to watch in all joinery.) The wedge or key is usually driven from what is the inner side of the frame, so that in putting on the lines this should be noted. Having all the preceding work done either by hand or machines, and having casings, beads, and wedges ready, to proceed to put the frame together, the bench should be *out of wind* or *twist*; if it is not so, two pieces should be laid across the bench longer than the width of the frame, which pieces should be true to each other, and nearly the height of the frame apart. Lay the pulley stiles on these near their relative position; bring near the sill, put the bottom end of the stile into the *trench*, and put in the key. Do the same with the other stile, and then put the other ends of the stiles into the head and key them in. One other remark about the sill—it should be *checked out* for the casings as far in as to the inside of the pulley stile: dotted lines are shown perpendicularly on section of the sill in Fig. 141 to indicate this, and these checkings serve as guides to the right position of the pulley stiles at the sill. The pulley stiles are nailed through head and sill, or the pulley stiles may be side-nailed from the back side into the sill. The skeleton frame is now squared and side nailed to the bearers temporarily to keep it square until the inner casings are fastened on. The inner casings are put on first, and the pieces on the stiles before the head, which is just fitted between quite tight, but not so as to force the side casings away. Sometimes blocks equal in length to the breadth of the pulley stile are nailed on the head to support the heading of the top casing and side casings outer and inner. When the casings are put on, the *staff beads* or *batten slips* may be mitred in and temporarily nailed; then two rough angle braces are usually put from the sides to the top, being nailed on the top of the inner casing through into the stiles, which serves to keep the frame from being knocked *out of square* until it is thoroughly fixed in its place. The nails which temporarily fixed the frame to the bench or bearers are drawn out, the frame is turned over, for the purpose of putting in the parting beads and putting on the outer casings. If the head has been grooved for a parting bead put it in (sometimes it is not), then *scribe* one end of the parting bead to fit the round of the top parting bead, and having obtained the length, fit the other end of each to the sill and put them in. The parting beads are not nailed in. Put on the side pieces of the outer

Fig 146



3" Scale

casings, and in doing so a little gauge is used, shown in Fig. 146.

The *check* in the gauge is made equal to the projection of the outer casing beyond the face of the pulley stile, and the gauge is applied against the pulley stile to test the projection of the casing before it is nailed. When the side pieces are nailed, the top piece is *scribed* in. It will be noticed that a little piece is required to be checked out at the bottom end of each outer casing for the sill, in order to allow it to have the necessary projection beyond the face of the pulley stile; this is owing to the sill being as broad as the pulley stile and casings combined. It is not needed at the bottom of the inner casings, as they are fair with the pulley stile. The casings are planed off fair with the bottom face of the sill, so that it may rest closely down upon the stone sill, a layer of white lead or sometimes lime putty being put between.

SOCIETY OF ENGINEERS.

On the 30th July the Society of Engineers visited the Outfall Sewage Precipitation Works, now in progress at Crossness.

The works at Crossness form the outfall into the River Thames for the whole of the sewage of the metropolis south of the river. There is an existing reservoir occupying about seven acres, divided into four compartments, capable of holding some 4,000,000 cubic feet of sewage, which can be stored for about eight hours per tide, and discharged at high water. The sewage reaches Crossness by an 11ft. 6in. barrel sewer, at a deep level, and is there pumped into the reservoir. The existing works are about to be supplemented by the Precipitation Works now in progress, the contract for which was let to Mr. Wm. Webster, last year, for the sum of £258,116, and which comprise the adaptation of the four compartments of the old reservoir, and the addition of a new reservoir, in area about 2¾ acres, in two compartments, together affording 1,000,000 cubic feet additional capacity, all the six compartments to be used as precipitation tanks, and are arranged to be used in succession, and jointly to provide for fully 12,000,000 cubic feet of effluent per day, the discharge of which will be distributed throughout all hours of the day and night, except when the tide is above the flow level, and then the effluent will pass into an effluent store underneath the new reservoir, and this store will be emptied into the river when the level of the tide permits. The sewage before entering the precipitation tanks will be treated with lime water and iron water, and will remain quiescent in these tanks for about two hours, during which time the solids will be precipitated, after which the effluent will be decantered over the lips of weirs as quietly as possible, so as not to disturb the precipitated sludge at the bottom. The effluent will be discharged into the river as above stated.

The sludge, known in this condition as "wet" sludge, will then be mechanically swept off the floors and passed into a sump or well, thence it will be pumped into another reservoir, divided into compartments called sludge settling channels, and there will undergo a second settling, by which its bulk will be further reduced; the second effluent, or "liquor," being quietly decantered over weirs, and used for making the lime water. The "settled" sludge will next be passed into a store, or receiver, beneath the sludge settling channels, and thence be pumped through pipes extending along the proposed jetty into the sludge ships, for conveyance and discharge into the German Ocean. The "liquor," or second effluent, being insufficient in quantity for making the lime water, will be supplemented by water from the river admitted at high water into the adjacent settling ponds. The "liquor" and water so obtained will be pumped up to the liming station to be erected on the top of the sludge settling channels, where the slaking and mixing will be effected, and thence the lime water will be run off through pipes into the low level sewer, which brings the sewage to the main sewage pumps, and will be supplied in such quantities as to furnish about four grains of lime to each gallon of sewage. Also on the top of the sludge settling channels, and next the liming station, there will be an iron-water station for grinding and dissolving proto-sulphate of iron, and supplying the solution in such quantities as to furnish about one grain of the iron to each gallon of sewage, the two chemicals, lime and iron, being both of them added to the sewage before it enters the precipitation channels. In addition to the present engine and boiler houses, and large sewage pumping engines, machinery, and boilers, there will be a new engine house and boiler house, with further pumping engines, machinery, and boilers, &c. The works are designed with a view to the treatment of the sewage for a future population of 2,400,000 persons, within the area of so much of the metropolis as lies south of the Thames.

CHIPS.

Alterations have been made to the Royal Pump Room, Harrogate, embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

A residence is to be erected on the Tyn-y-pwll estate, near Cardiff, for Mr. Shapland, from plans prepared by Mr. Charles C. Jones, M.S.A., 44, Charles-street, Cardiff.

The Durham County Asylum, Sedgefield, is being warmed and ventilated throughout by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester.

The County Council for the Holland division of Lincolnshire received at their last meeting the resignation of his office by Mr. J. Kingston, the county surveyor.

The tower of the parish church of Slapton, Bucks, is being restored, and the belfry is being prepared for a peal of five bells, the heaviest of which will weigh over half a ton. Mr. G. Garside, of Leighton Buzzard, is the builder. The nave of the church was restored ten years since, and the work will now be completed by the present repairs to tower.

The hospital chapel at Ilford is about to be enlarged and repaired, so as to seat 300 persons. The nave will be lengthened by 18ft., a south aisle added, the vestry rebuilt, and the chancel improved. Mr. Brookes is the architect, and the tender of Mr. W. Watson, of Ilford, has been accepted for carrying out the work at £1,747.

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ILLUSTRATIONS.

THE MOSQUE, WOKING.—NOS. VII. AND IX. WIGMORE-STREET.—DESIGNS FOR A MARKET TOWN RESTAURANT, AND A COCOA HOUSE AND VEGETARIAN RESTAURANT.—HIGHER COOMBE, HASLEMERE.—MELROSE ABBEY AND ST. MONAN'S CHURCH.—TWO OAK PULPITS.—ENTRANCE DOORWAY AT THE EXPOSITION UNIVERSELLE, PARIS.

OUR LITHOGRAPHIC ILLUSTRATIONS.

THE MOSQUE, WOKING.

Our illustration represents the front of this interesting building, which has lately been erected from the designs of the architect, Mr. W. I. Chambers. No description of the exterior is needed, as the drawing speaks for itself. As, however, this is the first mosque ever erected in this country, a few remarks on the general characteristics of these buildings may be desirable. It is greatly to be regretted that funds would not permit the erection of a minaret, nor allow the interior to be finished in a manner worthy of the beautiful exterior. One of the requisites of a mosque is that the principal interior wall, which is faced by those who pray, must be in the direction of Mecca, and in this instance it was thought desirable that every detail should be absolutely correct. Therefore, a captain of a P. and O. boat kindly went to Woking and took the bearings, and the true direction is engraved on a stone under cover near the Mihrab. Mosques are generally square, but can be any shape. The precincts of the mosque must be clearly separated by some obstacle in two concentric zones. The first, the exterior, where one can go without taking off one's boots, corresponds to the Court of the Gentiles; the second, or the interior, is a sort of esplanade, or estrade, to which one rises by one or more steps. This constitutes the holy estrade, the space specially reserved to prayer, which no contact by unbelievers is allowed to contaminate. Where the address is read is the Maysura, or reserved space. This is generally isolated by cloisters. In the thickness of the wall facing Mecca is placed the niche called Mihrab; this is always the most adorned portion of the place. In various other places, but always in walls facing Mecca, lesser or pseudo-mihrabs are constructed, either as ornaments or to show to those who pray separately the direction of Mecca: sometimes they are on the outside of the mosques, to the right of the mihrab. Relatively to the worshipper is placed a pulpit. Originally this consisted of two steps and a seat; to this simple estrade several steps and a little dome were subsequently added. In many mosques a cupola, supported by four columns, rises above the mihrab and the adjoining pulpit. At the present day some of the pulpits are very elaborate. Facing the mihrab, at a certain distance, is the dekke (bench)—a tribune stand made of wood or stone, supported by columns reached by a staircase. However, in small mosques, this "tribune" is often against the wall, facing the mihrab, and is constructed in the form of a balcony. In this tribune stands the reciter. There is also a kind of pulpit or lectarium for reading the sacred book. There are two kinds of reserved maysuras, or retreats, one general and the other special. In former times small galleries for women were provided; this is not the case now. The courtyards in front of mosques are generally square and inclosed by walls, and, as a rule, have a portico entrance in the centre of each wall, and under these porticoes the professors give their lessons, and rooms for students are annexed to the porticoes. Some mosques have an oratory situate at the side of the place for ablution, and is often adorned by a mihrab, to allow poor people who have no shoes to pray immediately after ablution. This place of ablution is a square reservoir, covered or open, and filled with water. It is generally in the centre of the courtyard, but it may be situate according to the exigencies of the locality; they also have a fountain (Hanafia) near the reservoir for fear the water may be stagnant or dirty, as no unbeliever or Mohammedan can enter a mosque who is not absolutely pure. Great controversy has ensued because the mosque at Woking has a dome, and what little adverse criticism the building has met with has been on this account, as many aver that domes are only admissible over tombs or commemorative monuments. Mr. Chambers, however, states he is prepared to justify every detail of the building from precedents. He admits, however, that the minaret is the chief ornament of a mosque on which the architect devotes his utmost skill. Some are of exquisite design, and the most beautiful known is that to the mosque of Rani Sipri. The number and position of minarets is a matter of taste. The mosque at Mecca has seven, that of Herat nine. If there is only one, it is generally at the side or above the principal door, or they are sometimes at a little distance. The number of circular balconies which garnish a minaret depends on the taste of the architect and on the importance of the building. These balconies are used for the purpose of calling the faithful to prayer. It is to be hoped that eventually the mosque at Woking will be provided with one at least of these necessary adjuncts. The ornaments which crown a dome or minaret have generally the form of a cresent raised on two or three globes. This is not, however, universal. Some have the form of a boat, as a symbol of the vessel of Faith. All the little articles of furniture of a mosque, and the various objects consecrated to worship, have similar terminals. By referring to the small plan in the corner, our readers will be able to follow this description.

NOS. VII. AND IX. WIGMORE-STREET.

These premises have recently been completed for the "Blüthner" Pianoforte Company, and are built of Lawrence's red facing bricks and rubbers and Portland stone. No. 9 was designed and carried out by Mr. Alexander Payne, architect, of 4, Storey's-gate, S.W.; and No. 7 by Mr. Payne and Mr. F. M. Elgood, of 98, Wimpole-street, W., acting as joint architects. As the lease of No. 11 was shortly to fall in, the intention of the architects was to arrange the buildings to group together, No. 9 being the central feature, and No. 7 being designed as a wing to be subsequently balanced by No. 11. The works were carried out by Messrs. Stimpson and Co., builders.

"B.N." DESIGNING CLUB: A COCOA HOUSE.

For description see page 138.

HIGHER COOMBE, HASLEMERE.

This house has recently been erected on Grayswood Hill, Haslemere, for Mr. Herbert G. Peake, of the Inner Temple. It is some 600ft. above the sea-level, and commands a magnificent view of the surrounding country. The walls of the ground story are hollow throughout, part being faced with a rough stone dug on the ground with quoins of Ham Hill stone, and part with a deep red facing brick made by the Rowlands Castle Co. The external walls of the upper story are built of brick, faced with local ornamental tiles nailed to the mortar joints. In the gables a free use has been made of half-timber work, the timber itself being tarred. The roofs are covered with local tiles. The house has been planned with a view to future extensions. In the rear is a range of stables for four horses, with coach-houses, &c., and rooms over, the whole being designed to harmonise with the house. The contract was carried out by Messrs. Tompsett and Kingham, of Farnham. The architect is Mr. Frederick Banister, of the Outer Temple, W.C.

R.I.B.A. SILVER MEDAL DRAWINGS.

These two admirable sketches are from the series for which a silver medal was awarded lately by the Royal Institute of British Architects to Mr. John Begg, of Glasgow. We published a large view drawn by him of the south transept of Melrose in the Building News for May 17 last, when a description of the abbey was given. To-day his sketch represents the east end of this beautiful church, which was founded by King David I., and built by King Robert the Bruce. The second picture gives a view of St. Monan's Church, Fifeshire, which stands close to the sea at the mouth of the Dreel burn. It was anciently known as Abercrombie, and is named after the patron saint Monanus, whom Skene, in his "Celtic Scotland," identifies with Moienn, Bishop of Clonfert, who died in 571. Mr. J. Russell Walker, however, in his comprehensive folio just published ("Pre-Reformation Churches of Fifeshire." Edinburgh: 67, N. Hanover-street) reminds us that, according to the legend of St. Adrian, Monennius was born in Pannonia, a province of Hungary, and preached at Abercrombie, where he was enshrined after his martyrdom. Monennius is identified by other historians with St. Ninian, of Whithorn, who is called Nynias by Bede, while Irish antiquarians identify him with their Monennius. David II. founded the present church about 1362. As it stands, it comprises the chancel of four bays, with south and north transepts, and a tower over the crossing. We hope at an early date to give some geometrical drawings of the church by Mr. Russell Walker, when we shall give further details from his book, which to all lovers of Scottish Mediæval architecture will be welcomed as an important addition to their libraries.

NEW PULPIT, CHRIST CHURCH, BRADFORD-ON-AVON.

This pulpit has been recently erected from the designs of Mr. John Oldrid Scott, F.S.A., architect. It stands upon a central groined base supported by flying buttress-like detached columns at the angles, and is made entirely of English oak. The pulpit itself is square on plan, with groined and canopied niches at the angles. In the central niche is a carved statuette of Our Lord, represented in the act of preaching, with right arm uplifted; the drapery and general grouping of the figure are very good. In the niche facing north is a statuette of St. John the Baptist, represented in a loose mantle, with a sheepskin dress; he points with the right hand towards the preaching Christ. In his left hand is grasped a wand surmounted by a cross. In the niche nearest the chancel is the prophet Elijah, a rugged-looking man, with long bearded face and hooded head; he holds a loaf in his right hand, and a raven, just perched on his shoulder, offers him another; at his feet is a second raven. The bases of these niches are supported by angels. All round the pulpit beneath the cornice is richly-groined pierced work; below are "linen" panels, into which tracery is introduced. In the interior of the pulpit, cut in, is the following inscription:—"To the memory of Agnes, wife of Rev. R. W. Lambert, M.A., vicar of this parish. Erected by her husband, A.D. 1889."

NEW PULPIT, NETTLEDON CHURCH, HERTS.

This pulpit of magnificent English oak has lately been placed in Nettledon Church, Herts. It was made by the well-known Cambridge church builders—viz., Messrs. Rattee and Kett—to designs and models, &c., of the late Marian Alford (sister of the Bishop of Ely), and who took great practical interest in the art revival of some years since. The pulpit is in memory of a former vicar, who was slightly deformed, and lies buried under a yew-tree close by, which accounts for the following curious inscription being upon one of the panels—viz.:

> "Beneath the shelter of this yew-tree's shade
> A little harmless rhyming Priest is laid,
> Who loved his life, tho' not of death afraid,
> And loved his Maker, tho' so strangely made."

The centre panel has a representation of St. John faintly cut upon it, and the other panels have lilies and other decorations similarly cut. The base, with its vine twining all round, has a very beautiful effect.

WAYSIDE NOTES.

In this happy land it is not often that any especial honour is vouchsafed to the architect. Either at the time of foundation-stone laying, or on occasion of the ceremonial attendant on the inauguration of the spick-and-span work, it is rare to find any marked compliment paid him. The newspaper reporters regard him as a nonentity, even if they are liberal enough to give the name of the builder of the edifice. Now they manage these things better in France. So marked, indeed, is the difference in the esteem in which the architect is held on the opposite sides of the Channel that often the name of the designer of a comparatively insignificant Parisian edifice penetrates into the editorial sanctum of our dailies, where the architect of an extensive London building is totally excluded. I am reminded of this subject, to which I have before had occasion to allude, by noting the treatment of M. André—an architect well known in the French capital—on the recent occasion of the opening of his new museum buildings at the Jardin des Plantes. M. André was presented with the Cross of the Commander of the Legion of Honour, and his name, thus brought forward, has gone out beyond the seas, and been introduced into "Paris Gossip," "Events in France," &c. Now, without setting more than their proper value on French decorations, I might ask, When is a similar honour bestowed on an English architect? Even knighting, it would appear, will soon be given up so far as matters concern our own profession, and reserved only for those in various callings who have been successful in the making of "piles," and sometimes, as we know, in the *driving* of piles. In this country the most assiduous labours of the architect seem to be judged unworthy of any public recognition.

There being no effect without cause, I have at times puzzled over this question—viz., the higher estimation evidenced on the Continent, and particularly in France, of the work of the architect. The French appreciate architecture where the English ignore it. Many explanations may be, and have been, advanced to account for this: the chief of which is to the effect that the Romance countries are naturally appreciative of art where the Anglo-Saxon is stolidly unappreciative. But it would seem to me to be a theory worthy of attention; that it is our inconstancy in style that is at the root of this matter; whereas, for weal or woe, the French architect, and Continental archirect generally, persevere in a style based on Classic precedent, and by so constantly adhering to one course, enable the laymen to appreciate their efforts at design. Here, however, with our Classic and Gothic revivals, our Queen Anne manias, and our fancies in Elizabethan, Jacobean, Flemish, Dutch, and what-not, no sooner are the public in a position to intelligently criticise the new architecture around them, than they are thrown on their beam-ends, figuratively speaking, by the sudden appearance of new forms, to the comprehension of which more education is required; and so we go on in this country. Whether this is for good or bad, it is not here the place to stop and inquire; but I advance the suggestion as worthy of some consideration. The Frenchman, volatile as he is supposed to be in other respects, has been pretty constant in the matter of architectural style, whereas we jog about from one to the other, with never-ceasing restlessness.

St. Edmund the King, one of Wren's City churches, is to be destroyed. The building is situated in Lombard-street, and should be familiar to all those who have gone the round of the quaint City churches, and been surprised what a lot of interest and architectural enjoyment may be obtained from a tour of inspection of these buildings. The *Athenæum* says that it is hoped that the tower and spire of the church will be retained; but anyone knowing the ways of the City church destroyers will be inclined to doubt this. "Why stick at the tower?" says the Philistine; and in this instance he has more than ordinary excuse for making away with everything. For the belfry of "St. Edmund the King and Martyr, and St. Nicholas Acons" occupies the most valuable portion of the site of the church. It is placed right in the centre of the frontage to Lombard-street—a frontage of 30ft. or 40ft. on the northern side of the way. And though it is a most welcome and picturesque object, rising as it does over a mass of essentially commercial architecture, it will assuredly be destroyed if the church is touched. I fear that those who look for the retention of the tower are basing their hopes on very shaky foundations, so those who admire the design had best feast their eyes upon it whilst it remains standing. As a matter of fact, however, it would not be difficult to retain the tower and yet gain two wide entrances to the area occupied by the body of the church, by way of the spaces between the tower and adjoining premises.

There is one point about these periodical raids upon old City churches that deserves attention. Why are they shut up and left to grow dismal-looking long before any attempts are made to pull them down? This one feels to be adding insult to injury. How long ago is it that I commented on the death-knell of St. Olave, Old Jewry? Yet ever since this building has remained a dismal outcast. Some desultory works have, it is true, been going on for many months, but the shell of the building remains intact, so far as concerns its external appearance. In the winter it looked wretched, and even with the summer's sun on the old plane-trees in the little churchyard it has a woe-begone appearance. It is a pity that when the authorities decree the destruction of these old buildings, that they do not defer shutting them up till they are prepared to raze them to the ground with due despatch.

Anyone passing through Dean's Yard, Westminster, will, I believe, observe indications of building activity in connection with a couple of houses contained therein. These works are being directed to the end of providing a temporary "Church House." The extensive building, of which we heard so much during Jubilee year, has had to be postponed for the very sufficient and oft-recurring reason of want of funds. Although something over an amount of £53,000 has been received by the council since the matter was first agitated, the greater part of this sum has, according to the statements of the Archbishop of Canterbury at the annual general meeting of the Corporation of the Church House, been expended on the purchase of the site and the tenements now being transformed into temporary premises. The Church, however, will not have to wait very long for its "house," if many more donors like the Duke of Westminster come to its aid with promises of endowments of £1,000 per annum towards expenses of the establishment.

I happened to be within a few miles of St. Alban's last week, but adverse circumstances prevented my visiting the Abbey, although, in the hope of getting the opportunity, had carefully pocketed a copy of the "Sheet of Contrasts." However, I do not intend to delay more than a week or two before making the special visit, for consideration of which Messrs. Longmire ought to lay down crimson cloth to receive my tread, and be prepared with a deputation and address; for although uninclined themselves to waste time upon the subject of the "Sheet of Contrasts," they don't apparently imagine that to get to the Abbey and back, and examine the work done, takes up my own time. Your correspondents still fight shy of detailing the inaccuracies in the drawings. Instead of so doing, they invite me to discourse upon "the ancient painted ceiling," with which I am wholly unconcerned, never having mentioned the subject. Anyhow, I am quite willing to let the matter of the "contrasts" alone until I have seen the actual portions of the Abbey represented therein.

Our friend "Ars" is going to take his holiday, it appears. I only hope that with a reinvigorated frame his mental faculties will undergo some transformation, so that when he returns to his "B. N." scales will have fallen from his eyes, and he will see Grimthorpean architecture in its true light, and become quite converted. I don't think that is a "stab in the back." He writes in your last issue that he is amused to find that I round on Mr. Pearson. This really cuts me to the heart. How often have I stood in admiration before the works of our only restorer, and how often have I turned out of the thronging street to enjoy a few quiet moments within their walls? But the writing of "Notes" of this kind brings upon one strange accusations. Not long ago I was accused of endeavouring to insinuate against the character of the late Sir Gilbert Scott, an architect whose life and works will always enjoy my humble esteem. I shed a silent tear or two to think that "Ars" should have been so unkind as to thus have added to my remorseful feelings. When an architect like Mr. Pearson is engaged so largely in restoration, he lays himself open to, and can scarcely be surprised that his works are the subject of, much criticism. I am prepared to maintain my opinions of the alteration to the design of the Westminster rose-window, and, until I have fuller information about the proposed works at Rochester, consider my comments thereon as just and fair. My views on the building appended to the W. side of Westminster Hall I have already given, and can quite comprehend Lord G.'s not appreciating the design. I don't see how it is possible that his lordship could appreciate anything truly architectural.

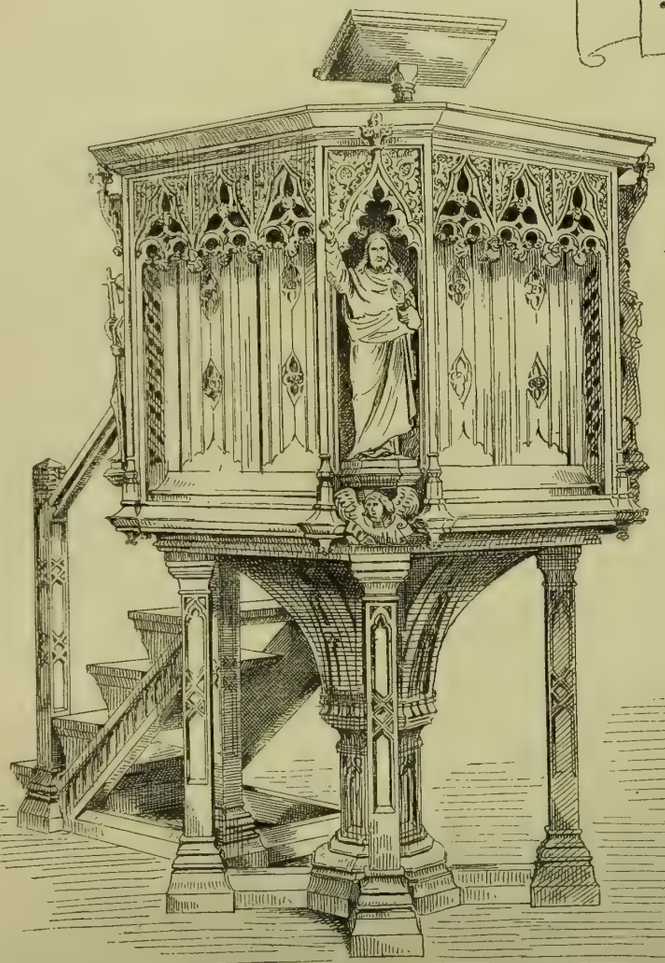
I met Mr. Farman the other day, and discussed with him the prospects of the Architects' Registration Bill. His assertion that opposition at the Institute is falling to pieces seems to be confirmed by the tone of the letters you have received, and by the feebleness of the protest and statement issued from Conduit-street. The extraordinary position taken up with regard to the engineers and surveyors is indeed astonishing. I did hear that the Institution of Civil Engineers were going to oppose the present Bill, but this would simply be the means of making themselves look ridiculous. On the occasion of Colonel Duncan's introducing the late Bill, all the talk turned on the point of the inclusion of the engineers, and M.P.'s won't have forgotten the fact. The same may be said with regard to any opposition that may be induced on the part of the surveyors. The prospect of success for the present measure stands very high as compared with the last attempt, and if, as may be anticipated, your suggestion as to the most desirable course to be taken by the Registrationists within the Institute are acted upon, the chances of our quickly becoming a registrated body of practitioners are greatly increased. One thing is very certain, and that is that this second effort of Mr. Gough and the Registration Committee will not be thrown away. In any case, it is evident that a distinct advance will have been made. Certainly, within the ranks of the architectural profession, a large number of those who have been wavering between action and inaction have been persuaded, or have of themselves decided, to assist the agitation for registration. Loyalty to one's professional society is a very proper sentiment; but when, as in the case of the Institute, delay and inaction in any affair of importance is evidenced by its elders, the members are equally culpable if they show the same indifference. The letter you have received from "A Fellow of the Institute" indicates the temper of a large proportion of Fellows and Associates. Unless, therefore, the R.I.B.A. Council quickly brings forward a scheme of Registration of its own, it cannot affect surprise if a large body of its members are loudly adverse to its present policy. Says "A Fellow of the Institute," "we are very decidedly in favour of the proposed legislation, though many, like myself, would have been better pleased had the initiative been taken by the Institute." There are bounds to patience, however, and if the R.I.B.A. does not take the initiative, its Council cannot complain of, what it may term, the *disloyalty* of its members.

I see a young and enthusiastic member of the Association has a grand scheme on hand whereby the co-operation of the clergy, the nobility, and laity—in fact, of all good people, of all sorts and conditions—is to be enlisted for the benefit of the profession. I don't quite profess to understand the details of Mr. Earle's scheme: probably they are hardly apparent to himself, but activity of any kind is refreshing. I can't concentrate my own mind very strongly on architectural reform in the August Bank Holiday week; but I dare say the shining lights of the profession on the Council of the Institute will—their sempiternal zeal on behalf of everything that can benefit the young and rising practitioner is too well known to need encouragement. Meanwhile, don't be discouraged, Mr. Earle, if indifference chills your enthusiasm. I have been pegging away these thirty years, and, after all, have done little worth speaking of for the art we all love so well, and its professors; but you may be more fortunate, though I don't think you will in your present motion. Good luck to you, all the same!

Goth.

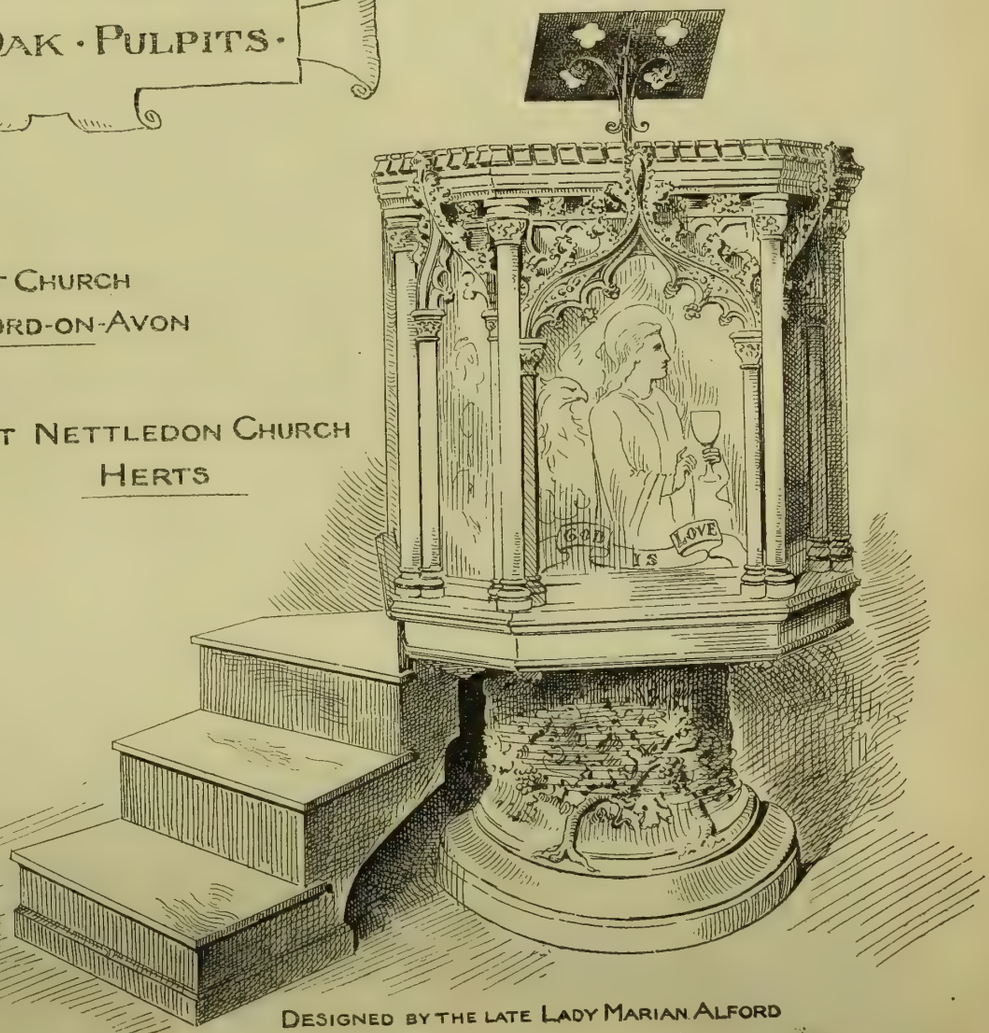
TWO OAK PULPITS

AT CHRIST CHURCH
BRADFORD-ON-AVON



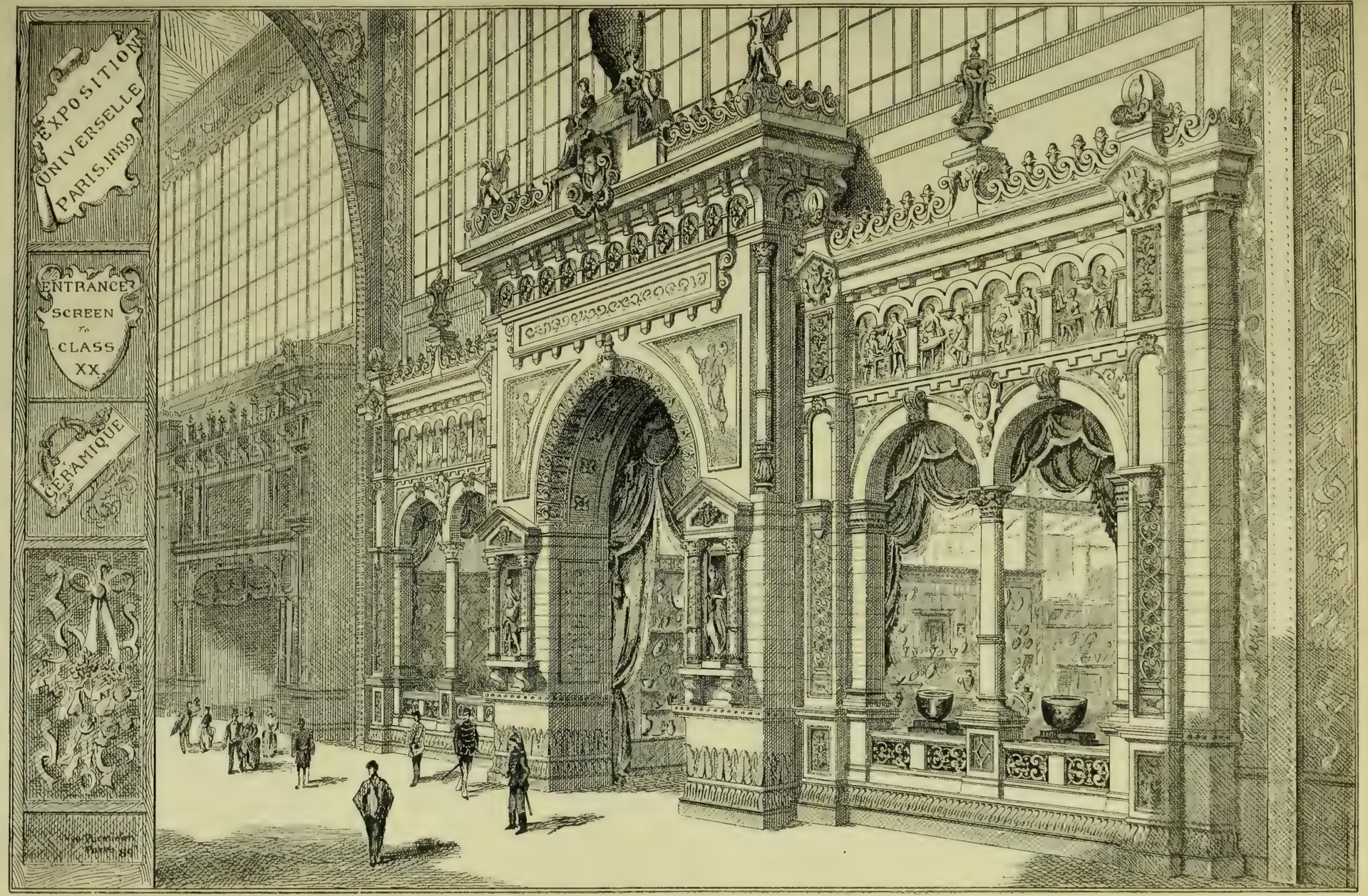
JOHN OLDRID SCOTT F.S.A. ARCHT
HARRY HEMS SCULPTOR

AT NETTLEDON CHURCH
HERTS



DESIGNED BY THE LATE LADY MARIAN ALFORD
MADE BY MESSRS RATTEE & KETT.

E. CHANCELLOR, DEL. JY 1889


EXPOSITION
UNIVERSELLE
PARIS, 1889
ENTRANCE
SCREEN
TO
CLASS
XX
CERAMIQUE

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—XLIX.

By Henry Lovegrove, F.S.I., Surveyor.

SPECIFICATION OF THE WORKS REQUIRED IN THE ERECTION OF A LYCH GATE.

PROVIDE water for the use of the works. Excavate for the foundation of piers. Ram round after the walls are built, and cart away superfluous earth.

Lay in concrete foundations 4ft. wide and 18in. deep, the bottom of the concrete to be at a depth of 4ft. below the ground level, and to centre pier 3ft. 4in. wide.

The piers to have damp course of asphalte ½in. thick, and are to be built of local flints in cement, faced with cracked flints laid in random courses and pointed.

Carefully bed the oak slabs on the piers.

Tiler.—The roof to be covered with Broseley tiling laid to a 3in. gauge, and fixed with galvanised iron nails.

The verges to be neatly formed and pointed with Portland cement, the eaves to be laid double, the ridge of red tiles bedded and jointed in cement.

Mason.—The stone to be a good sandstone laid upon its natural quarry bed in the work, and to be carefully worked to detail drawings and moulded as shown.

Carpenter and Joiner.—Provide ¾in. deal sawn battens for Broseley tiling, and 1in. sawn English oak V-jointed boarding under same.

The whole of the framing of roof, &c., to be of sawn English oak, put together with oak pins.

Rafters 6in. long by 3in., with sprockets out of 6in. by 3in. and 1ft. 9in. long; the ends of rafters cut as shown; tie-piece 8in. by 6in., ends moulded; collars 6in. by 3in., and 9in. by 6in.—the ends of latter cut, moulded, and chamfered; the posts 11in. by 6in.; the curved struts 6in. thick, 4ft. 6in. long, and 12in. extreme width; oak sill 12in. by 6in., bolted with No. 4¾ wrought-iron bolts; ends countersunk; the longitudinal ties 6in. by 4in., and 11in. by 6in.; four brackets 15in. by 15in., and tie 5in. by 4in.; cross-tie and post, 6in. by 6in.

The coffin slab to be 18in. by 6in.; edges rounded and fitted with brass friction rollers and plates let into oak slabs and fixed with screws 2in. wide and 3½in. diameter.

The gate-posts to be 4in. by 4in., bolted with ¾in. bolts; the gates to be 2½in. oak; wrought framed dwarf gates in three panels—the upper one open and filled in in with square-framed bars, the lower panels square framed, but chamfered on bottom rail; all put together with oak pins; the middle rail chamfered and top rail reeded, and the edge rounded.

The gates to be hung with stout 3½in. butts and fitted with wrought-iron ornamental latch with twisted drop ring-handle.

Smith, Plumber, and Painter.—Provide and fix a wrought-iron finial to design 5ft. 3in. high, with rounded bolt; the base to be dressed round with 7lb. lead.

All bolts to be painted two coats, and the finial four coats.

EXCAVATOR AND BRICKLAYER.

Cube. Dig and cart.
112 0
33 4
145 4
5 10

Cube. Concrete.
112 0
33 4
145 4
5 10

Reduced brickwk. in mortar.	
1 B.	1½ B.
3 10	30 4
27 4	4 0
4 0	6 7
35 2	40 11
11 9	23 5
23 5	64 4

Building ¾in. bolts in wall.
1ft. 6in. long.
12

Dig and cart, part fill, and ram.
186 8
55 7
242 3
9 yards.

Supl. Wall of local flints, 15in. thick, in cement.

11 3

1¼

Do. do., but 18in. thick.

38 8

4⅓

Supl. Asphalte damp co. and spreadg in walls.

25 9

Supl. Bedding and slab on stone wall in cement.

5 7

Ex. only in ct.	
1 B.	1½ B.
3 10	30 4
27 4	4 0
4 0	6 7
35 2	40 11
11 9	23 5
23 5	64 4

Ex. to facings in cracked flints, and pointing in random courses.

22 6

67 4

89 10

10

Run. Bedding 12in. by 6in. oak on stone coping.

11 10

TILER, &c.

Broseley tiling laid to a gauge, and fixed with

292 6

Run. Portland cement filleting and pointing to verge.

39 0

Red tile ridge bedded and jointed in Portland cement.

15 0

Labour and waste cutting tiles.

39 0

30 0

69 0

Ex. to double course of tiles at eaves.

30 0

Ex. labour to cutting and fitting ridge tile to finial.

1 do. do. to base of do.

1

MASON—SANDSTONE.

Cube. Stone, and hall sawing and setting.

20 6

24 0

11 3

55 9

Supl. Plain face.

20 6

56 0

29 3

105 9

Moulding.

22 11

Beds and joints.

29 0

40 0

19 0

88 0

Circular stopped sk. face.

2 4

Circular sunk face.

9 0

Stopped moulding.

14 11

Cir. moulding 1½ girt in sunk panel

5 8

External mitres to moulding.

8 = 14in.

Internal do.

4 = 14in.

Hole through 1½in. stone for ¾in. bolt.

4

Carving Maltese Cross in cir. sunk panel 10in. dia.

2

¾in. bolt let in and run in lead.

4

CARPENTER AND JOINER.—OAK.

All the following to be in sawn Englisk oak, framed together with oak pins.

Supl. ¾in. deal sawn battens for Broseley tiling.

292 6

Cube. In. framed rafters, &c.

27 9

9 10

9 11

10 6

5 11

8 10

3 6

76 3

1in. sawn English oak V jt. and boarding to form ceiling to roof.

292 6

Sawn slab. Cube.

3 9

Ends 6in. by 3in. rafters cut cir.

24

Cut cir. or mld. ends to 8in. by 6in.

4

Wrot., cut, and mld. ends to 9in. by 6in.

4 Do. to 6in. by 6in.

4

Splockets out of 6 by 3, and 1 9 long.

24

Framed blocking splayed out of 6 by 5in. and 2ft. long.

4

Supl. 2½in. wrot. and framed dwarf gate in 3 panels, the upper one open and filled in with sqre-framed bars, the lower panel sqre-frmd., but chfd. on bottom rail, all put together with oak pins.

30 0

Run. L. splay cutting on 6in.

27 8

L. rounded edge on 6in.

13 0 Do. of 2½ rail.

5 8

6in. framed struts, 4ft. 6in. long, 12in. extreme width.

4

Cut brackets out of 9in. by 6in. by 1ft. 9in.

4

Curved brackets 5ft. 1in. long, and 18in. extreme width.

4

4in. brackets 15in. by 15in. extreme size, cut circular front edge.

2

L. rd. corner in drs.

2 do. end 6in. wide

2

L. chfr.

11 4

L. forming reeding

11 4

4in. by 4in. frd. post.

18 0

5in. by 4in. framed tie.

14 3

Ends bolts countersunk in oak.

4

Quadrant-rounded corners to 6in.

4

4in. brkts. 3ft. 3in. long out of 12in. wide, cut circular front edge.

4

Ironmongery, scrs. and fittings. Pairs 3½in. butts.

2

Ornamental W.I. latch with brass handles.

2

Brasses, friction rollers, and plates let into oak slabs, and fixing w. scrs. (2in. wide and 3½in. diar.)

4

SMITH, &c.

Run. ¾in. screw bolts.

6 0	H.N. & W.
4 0	4
18 0	4
28 0	12
	20
	72
0 2 16	

Wrot. iron finial to design as sk., 5ft. 3in. high, with rounded bolts and fixing in oak, 2ft. 3in. across.

1

7lb. lead dressed to finial. Supl.

2 8

19

Run. L. circular cutting on do.

3 4

Run. Iron bolts, paint 2 oils.

6 0

4 0

18 0

28 0

Finial do.

1

THE SOCIETY OF ART MASTERS.

THE annual meeting of this society was held on Wednesday in the Lecture Theatre of South Kensington Museum. Mr. Edward R. Taylor, chairman of council, head master of the Birmingham Municipal School of Art, presided, and was supported by between thirty and forty representatives of the principal schools of art in the United Kingdom. Mr. Francis Ford, of Fulham, the hon sec., read a number of letters from members of Parliament expressive of sympathy with the objects of the movement. The chairman said the present system of administration was too costly alike in labour, time, and money to work well either for the central Department or the schools themselves. Originally the machinery was very simple, and worked smoothly; but by successive changes it had grown so complicated as to be productive of much friction, and to be unduly expensive relatively to the results and the primary objects aimed at. The regulations were mainly framed with a view to securing payment by results; but, unfortunately, the convenience of the staff of the central Department was studied prior to the welfare and progress of the students and the numerical increase of the schools. Examinations were becoming an actual hindrance to the working of schools, and the keeping of registers involved much waste of time. It had been asserted, and was generally believed, that the standards set by the Department for judging the results of examination were raised or lowered to suit the gross sum at disposal; such a system of apportioning marks was unfair, and a source of possible distrust, which, in the interests of the Department, ought to be abolished. He thought it was most desirable that a conference should be sought between the Department officials and the members of that society, so as to remove any causes of misunderstanding and grievance.

After some discussion, the Chairman moved that a conference be held to which the members of the Society, the officials of the Department, Members of Parliament, at least one artist of distinction unconnected with the Department, and chairmen and secretaries of schools of art committees be invited. This was seconded by Mr. J. P. Bacon, of Stoke-on-Trent, and after a discussion in which Messrs. J. North Smith, Bristol; S. T. Cartlidge, Hanley; Herbert Gilbert, Lancaster; Michael Sullivan, Hastings; George Trobridge, Belfast; Frank H. Swinstead, North London; John Windus, Alfred Fisher, A.S.A., Gosport; Edward Renard, of Shipley, and the secretary took part, was carried. The subjects to be discussed were mooted, but were left to the Council to decide.

The Bill to facilitate the provision of technical instruction, introduced into the House of Commons last week by Sir W. Hart-Dyke and Sir M. Hicks-Beach, was brought forward by the chairman, who succinctly explained its leading provisions. It proposes to give power to local authorities to aid the supply of technical instruction, the rate, as in the case of the Free Libraries, not to exceed 1d. in the pound per year. It also gives power to managers to transfer technical schools to the local authority, and provides that the conditions on which Parliamentary grants in aid shall be made shall be those of the Department of Science and Art. A "local authority" is interpreted to mean any borough or county council and any urban or rural sanitary authority, and "technical instruction" shall mean "instructions in the principles of science and art applicable to industries, and in the application of special branches of science and art to specific industries or employments." The Act is not to extend to Scotland or Ireland. The Chairman having gone through the clauses, expressed the general approval of the council of the society of the Bill. Mr. Jas. Brenan, of the Metropolitan School of Art, Dublin, moved that a letter of approval be forwarded to Sir W. Hart Dyke, and that the Society send a memorial in support of it to Parliament. He strongly supported the resolution, and said that on the success of this Bill depended the future of schools of science and art. Clause 5, defining technical instructions, was a very good one, and drawn up on terms favourable to members of that Society. This was seconded by Mr. Bacon. Mr. R. T. M. Allan, Harris's Academy, objected to the Bill, as the transfer to local authorities would in some cases fetter or close a school; but the chairman and Messrs. Brenan and Trobridge assured him that a school under municipal control was better and more smoothly managed, and, besides, the Bill would not apply to Scotland. After some further discussion and favourable comments on the Bill, the resolution was carried unanimously.

On the motion of the Chairman, seconded by Mr. Sullivan, it was resolved: "That, in the interests of art education throughout the country, this society renews the expression of a strong desire that the measure of success attained by each candidate in the annual examinations, as indicated by marks, should be communicated to the schools."

The Chairman next moved: "That while the members of this Society are content that the amount of payment on results should be dependent on the amount of the Parliamentary grant available for this purpose, they feel that the best interests of the students demand that the results of the examinations, as determined by the examiners, independently of the grant, should be communicated to the masters and students. They

would also suggest that the amount payable on each minimum pass might be determined by the Department *after* the results of the examinations are known."

Mr. Fisher, of Gosport, read a paper in which he urged that the present system of payment by results should be abolished in the interests alike of students and masters. If this system were done away with, all art masters' grievances would disappear, and the schools would be placed in a more satisfactory condition. The Department found they had not money enough to meet the requirements of schools under present conditions, and at the suggestion of officials and masters they tinkered away at the regulations to suit altered conditions; but like the proverbial tinker, they made two new holes for each one they mended. The failure was due to the rotten and accursed system, and not to the Department. Payment by results had a taking appearance, but art education could not be dealt with on purely commercial principles. The objections to the system were that firstly, it attracted too much attention to the results of examinations, and looked too little to the aims and results of education; and, secondly, it caused the standard of education to vary with the state of the national exchequer, or the transfer of power from one political party to another. It was a system that had been adopted by no other nation than England. Thirdly, it had a tendency to limit the teaching to subjects which could be tested, to force students to study subjects having little reference to their future career, and it did not pay masters in proportion to their labour. He urged that a more fair mode of payment would be to pay by average attendances or by salaries.

The resolution was seconded by Mr. Bacon, and spoken to by Messrs. Swinstead, Gilbert, Brenan, Allan, and Reynard, and was carried unanimously.

At this point Major-General Donnelly, C.B., the Secretary of the Science and Art Department, entered, and was informed of the outcome of the discussion by the Chairman. Having welcomed the members, and promised to give them every assistance in his power, General Donnelly said it was not likely they would always agree on all points; but one of the best methods of removing friction was for each side to realise the point of view from which the other side looked at a question, and so understand the reasons for action. The suggested amicable conference would be of very great value; but he doubted whether it was well to give it a grandiose appearance by inviting M.P.'s, artists, and secretaries of local governing bodies to join in the discussion. The visitors would need to be coached up to the matters under discussion, whereas representatives of the Department and members of that society could directly address themselves to the points at issue if no outsiders were present. He noticed that a reporter was present, and should wish it to be understood that that meeting was private, and any views he might express were personal ones. He was very glad the members approved of the Technical Instruction Bill, and believed that if passed and taken up by local authorities it would be of enormous advantage to schools of art. It would meet with great opposition from school boards; but on account of the difficulties between those boards and other rate-aided schools, there had been no attempt to include elementary teaching in science and art within its scope. As to learning the results of examinations, members ought to be aware that at present every master or committee could have the results as to their school by applying for them. It would involve great additional clerical labour were the number of marks sent out to every school; but he quite appreciated the desire many had to know if their scholars only just failed, or were hopelessly low down, and any communication from a school on this point should receive attention and answer. As to the resolution just passed, he denied that the standard set by the examiners was raised to suit the funds at disposal. In reply to the assertion, which was quite unfounded, he would point out that in the last examinations completed, those of May, 1888, certain subjects proved, he supposed, too easy, and the consequence was, the Parliament grant having been exceeded, a supplemental grant of £1,000 had to be voted. If members would take the trouble to follow the votes in Parliament they would see this charge was unfounded. Indeed, the standard had sometimes to be lowered. Now and then the examiners would set a question or subject which they thought an average one, but the number of failures showed that it presented some extra difficulty. As these replies usually worked out to an average of successes, an increasing average all over the country, in adjudicating on such subjects that particular time the number of qualifying marks was reduced, so that a fair award of prizes might be made. General Donnelly was questioned by Mr. Walter Scott, of Norwich, and Mr. Bacon, as to whether the Lancashire art masters had not complained last year of a loss of 25 per cent. of the grant; but he replied that, if so, it was due to a falling off of individual schools. Roughly speaking, about half the schools last year showed a falling off of £2,000 in grants, and the other half an advance of £3,000, making about a £1,000 net increase. The total grant per head averaged 12s. 6d. in 1880, against 12s. 1⅝d. per head in 1887.

General Donnelly having left, the following resolutions were passed, on the motion of the Chairman:—"That the examination-paper in Section 1 of the elementary stage in practical plane and solid geometry should be a distinct and separate paper, not, as at present, printed on the same sheet with more advanced stages of the same subject." "That the registration in Art Schools be confined to two sections only—elementary 2nd grade, and advanced 3rd grade, that the minimum number of attendances for the 2nd grade remain as at present, and that 30 attendances be the minimum number necessary to support a claim or claims on any subject or subjects of the 3rd grade."

ARCHITECTS AT CRICKET.

MR. EDMUND KIRBY'S OFFICE V. MESSRS. GRAYSON AND OULD'S OFFICE.

IT has been the custom for the last three years for these two Liverpool architects' offices to engage in an annual match, the encounter this season being decided on the Liverpool College ground on the evenings of Thursday and Friday, July 25th and 26th. The game being decided on the first innings, resulted in a win for Mr. Edmund Kirby's assistants.

MESSRS. GRAYSON AND OULD'S OFFICE.

	1st innings.		2nd innings.	
T. Brown b Hulme	0	c Waller b Thornely	10
J. H. Harris b Gilbertson	9	b Greene	2
T. E. Eccles b Thornely	21	c Gilbertson b Fraser	36
E. L. Nobbs c Gilbertson b Thornely	5	b Gilbertson	0
E. G. Dickenson run out	14	c Hulme b Gilbertson	24
G. Page c Smout b Greene	0	b Gilbertson	0
H. Evans b Greene	3	b Thornely	3
G. Ware b Greene	13	c Hulme b Gilbertson	2
O. Burton c Smout b Thornely	5	c Smout b Thornely	0
D. Knight not out	1	b Thornely	2
J. Woolfall c and b Thornely	0	not out	2
Extras	5	Extras	3
	76		84

MR. EDMUND KIRBY'S OFFICE.

H. L. Thornely c Eccles b Nobbs	33	not out	10
A. Gilbertson b Eccles	0	not out	13
T. Hulme b Eccles	4		
W. H. Greene b Eccles	1		
G. Fraser c Page b Eccles	39		
T. Smout c Evans b Eccles	0		
R. Lewis c Eccles b Nobbs	6		
W. F. Waller b Eccles	0		
J. London not out	1		
T. W. Haigh run out	0		
J. H. Price absent	0		
Extras	7	Extras	4
	91		27

BUILDERS' BENEVOLENT INSTITUTION.

THE forty-second annual meeting of this Institution was held on Thursday, July 25, at Willis's Rooms, St. James's, Mr. J. Howard Colls, the President, in the chair.

The chairman moved the adoption of the report, which stated that during the past year six deaths had occurred. In two cases the wives had taken the place of the deceased, and one male and one female pensioner had been elected. Happily the income for the past year from all sources had been sufficient to cover the necessary expenditure, and this was greatly to be ascribed to the exertions of the president to obtain donations at the annual dinner, and to the continued generosity of the subscribers. The annual dinner will take place, with the consent of the Worshipful Company of Carpenters, at their hall on Thursday, 7th Nov. next, when Mr. J. W. Hobbs, who has kindly accepted the position of president of the Institution for the ensuing year, will preside.

The chairman, in moving the adoption of the report and balance sheet, congratulated the meeting on the fact that the Institute was going on progressively.

Mr. Thomas Stirling seconded the motion, which was agreed to.

Votes of thanks were passed to the president, the vice-presidents, trustees, treasurer, committee, and auditors.

The chairman then moved that Mr. J. W. Hobbs, Mayor of Croydon, be the president for the ensuing year. He believed Mr. Hobbs would use his utmost endeavours to further the interest of the charity. (Applause.)

On the motion of Mr. Russell, a cordial vote of thanks was passed to the chairman for presiding, and the meeting separated.

VISIT OF THE SOCIETY OF ARCHITECTS TO CARDIFF.

THE programme of the forthcoming visit of the Society of Architects to Cardiff is finally settled as follows:—

Local Committee.—Mr. E. Seward, F.R.I.B.A.; Mr. E. W. Corbett, F.S.I.; Mr. H. Snell, A.M.I.C.E., M.S.A.; Mr. F. Baldwin, M.S.A.; Mr. H. Bruton, A.R.I.B.A.; Mr. Chas. C. Jones, M.S.A.; Mr. Geo. Thomas, M.S.A., local hon. sec.

Monday, August 26.—Conversazione and Reception of visitors by the Mayor of Cardiff (Mr. David Jones), at the Assembly Rooms, Town Hall, Cardiff, at 8 p.m.

Tuesday, August 27.—Excursion in brakes, leaving Westgate-street, rear of Town Hall, at 10 a.m., to Llandaff, Castle Coch, and Caerphilly Castle. Luncheon at Caerphilly Castle. A meeting of the society will be held at Caerphilly Castle at 3.30 p.m.

Wednesday, August 28.—At 10 a.m.: Visit to Cardiff Castle, the Docks, new ironworks in course of construction for the Dowlais Iron Company, and other places of interest in Cardiff. Afternoon and evening: Visit to Penarth and Windsor Gardens. Trains leave Cardiff for Penarth from G.W.R. Station at 3.39, 4.28, and 5.18 p.m., returning from Penarth at 7.20, 8.20, and 9.15 p.m.

Thursday, August 29.—Excursion in brakes, leaving Westgate-street, rear of Town Hall, at 9.30 a.m., to the West of Cardiff, visiting various points of interest on the route, including Llantwit Major, Llantrithyd Place, Cowbridge, &c. Luncheon at Llantwit Major; tea at Cowbridge.

Friday, August 30.—Circular tour by Great Western Railway to Chepstow, Tintern Abbey, Monmouth, and Raglan Castle, following the course of the Wye Valley, by train leaving the Great Western Railway Station at Cardiff at 10.10 a.m. Evening at 8 p.m.: Concert at the Exhibition of the South Wales Art Society and Sketching Club at the Queen-street Public Hall.

The Exhibition of the South Wales Art Society and Sketching Club will be open at the Queen-street Public Hall during the visit of the society. Further information may be obtained from, and applications for tickets for the various trips to be made to, Mr. G. A. T. Middleton, A.R.I.B.A., St. James's Hall, Piccadilly, W.; or Mr. George Thomas, M.S.A., local hon. sec. to the Society for Cardiff and District, Queen's Chambers, Cardiff.

FURTHER DEVELOPMENT OF THE PARTY-WALL QUESTION AT COVENTRY.

THE question of the thickness of party-walls is still exercising the minds of the public bodies of Coventry. The Urban Authority, as represented by the City and County Council, have the matter under consideration in connection with the whole of their by-laws in committee; but, at the Council meeting on Tuesday, the following minute from the Sanitary Committee was read: "Councillor Loudon attended the Committee on the question of No. 6 Building Law, and the enforcing of the same with regard to party-walls. Resolved that the Committee do not see sufficient grounds for the general enforcement of the by-law, considering that the discretion of the committee in the matter should not be taken away. It was resolved further that where in respect to the height of the houses, or the class to be built, the surveyor considers a 9in. wall required, he shall enforce the by-law."

Councillor Loudon wished to know if they were not putting the town clerk in an invidious position by making such a recommendation, and whether the members of the Council would not be under some misapprehension. The town clerk was in the habit of holding up plans and announcing that they were correct, by which the

nembers of the Council understood they were correct according to the by-laws. He asked if t would not be more correct to say "Correct according to custom," and make no mention of he by-laws; certainly it would be more dignified.

The Mayor pointed out that it was the surveyor who passed the plans as correct, and the own clerk explained that it was only his duty to ead the endorsement which the surveyor put on he plans.

At the meeting of the board of guardians on Wednesday, Mr. T. G. Beamish presiding, the ubject also cropped up. Mr. Goate was understood to say that he should be fully prepared t the next meeting to bring forward a motion escinding the recent decision of the Board, acting s the urban sanitary authority, to enforce the by-law demanding that all party-walls should be in. thick. In reply to questions as to the particular plan of Mr. Gilbert's for three houses in Red-lane, which was the first to fall under the ction of the Board, the surveyor stated that he plans had not been amended, and he ad communicated with the architect, Mr. Langley, that the Board refused the plans s not correct. Several members expressed an pinion that the plans which were prepared efore the decision of the Board was known, and which had put Mr. Gilbert to expense, besides the uilding having to stand still, should be passed.

Mr. Goate proposed, and Mr. Loudon also being f opinion that it would not affect the discussion ext week, supported that the Board allow the lans which had led to all the discussion to pass. The position of affairs now is this: that the Urban Authority has practically decided to go on assing plans with 4½in. party-walls, subject to he discretion of the surveyor, and the Rural uthority insists upon 9in. walls in every nstance, unless Mr. Goate next week is successful in rescinding the by-law. This, judging rom the disposition of the Board, is somewhat oubtful.

EXPOSITION UNIVERSELLE, PARIS, 1889.

ENTRANCE DOORWAY TO THE CERAMIC AND MOSAIC SECTION.

THIS doorway, by Monsieur Deslignieres, is one of the most interesting of the series eading from the "gallery of thirty mètres," nd forms the entrance screen to the section conaining exhibits in ceramic and terracotta ware. he greater part of the doorway is built in lternate courses of buff and yellow terracotta. he colouring and form of the different ornaents are most varied; but the general *ensemble* armonises well. The bas-reliefs are in namelled white ware; the tympani over the rchway are inlaid with gilt mosaic, with the gures in colour. The figures in the niches are f white enamel, and the columns on either side f enamelled green. In the frieze are bas-reliefs epresenting the manufactures of earthenwares. his screen is interesting as showing what can e done with terracotta and other ware as regards olour and form, every arris being perfect, and ie colours uniform in tone. This drawing was ade by Mr. Arthur Vye-Parminter, of Paris nd Swansea.

At Messrs. C. Vaux and Sons, the brewery, Sunerland, a 7¼in. internal diameter tube well, 221ft. eep, has just been completed through magnesian nestone. The supply obtained exceeds 3,000 allons per hour, and is pronounced of excellent uality. At the Friary and Holroyd's Brewery Co., uildford, the supply recently obtained from a 0ft. tube well is also of a very good quality. essrs. Isler, who carried out both these underkings, are also engaged at Messrs. Ridley, Cutter, nd Firth, Manor Brewery, Newcastle-on-Tyne; essrs. R. Barker and Co., Hington Brewery, near verpool; and at Messrs. T. Brogden and Sons, ewers, Tockwith, Yorks, where, so far, the proess of the work has been at the rate of 20ft. per y through sandstone. The same speed of work s also been accomplished at Walsham-le-Willows. mongst other places, we learn Messrs. Isler are ring in the neighbourhood of Bradford. Owing several modifications made of late in their system tube-well boring, they are in a position to offer ceptional terms.

The City Court of Common Council have accepted a permanent loan for the Corporation Art Gallery a series of portraits of the Imperial family of ussia belonging to the Russia Company. They clude Peter the Great, Catherine the Great, and cholas I.

Building Intelligence.

HANLEY.—The first stone of the new Roman Catholic Church of the Sacred Heart in Jasper-street, Hanley, was laid on July 25th. The contract for the new building, which has been placed with Mr. J. Godwin, of Hanley, who erected the Victoria Hall and Sessions Court, is £4,200; but on account of alterations that sum will be increased before the church is completed. Mr. H. V. Krolow, of St. Helen's and Liverpool, is the architect. The style will be French Gothic of the present century, very freely treated. The extreme length will be 150ft., and the breadth 60ft., and the church will be cruciform, with nave, aisles, two transepts, and Lady-chapels on the north and south sides. An important feature of the church will be the exceptionally large proportions of the sanctuary. This, which will be 45ft. deep and lofty, will be divided from the two Lady-chapels by oak screens, with traceried heads. Diagonal wood blocks will be used for flooring purposes, and the roof will be open and of pitch pine. On the south side of the church will be the sacristies for priests and boys, the confessionals, and offices. The building will be approached by an ante-chapel, divided from the main body of the church by oak screens. A tower will be commenced at the north-west corner, but will, under this contract, not be completed. At the south-west corner will be the baptistery. Red brick and stone will be used in the external work of the church. The architect has received instructions to draw up plans for the erection of a nunnery eastward of the church.

MONKWEARMOUTH.—The Roman Catholic Church of St. Benet, the Causeway, Monkwearmouth, was consecrated last week by the Bishop of Hexham and Newcastle. The new church adjoins a presbytery on the west, and has been erected from the designs of Messrs. Dunn, Hansom, and Dunn, Eldon-square, Newcastle. The style adopted is Early Decorated, the windows being filled with tracery of simple geometric forms. The interior dimensions are: 112ft. in length, and 52ft. in width, with sitting accommodation for 800 or 900 people. The carving is by Mr. Boulton, of Cheltenham. The sanctuary is of the same width as the nave, and is flanked on either side by chapels, one of which is dedicated to the Sacred Heart, the other to Our Blessed Lady. A large tracery window occupies the east end, and is placed high up in the wall, leaving sufficient space below for the super-altar. The windows, with one exception, are all of cathedral glass, and bear monograms of various saints, that of the patron saint being in the centre of each. The altar, which has been executed by M. Pierre Peeters, of Antwerp, is of solid stone, and when completed will be 32ft. high. It is at present being erected by Belgian workmen. The tabernacle is of solid brass, and the doors are guarded by two angels of the same material. Red pressed bricks (from Commendale) with white stone dressings are used externally. Most of the church floor is laid with boards, the exceptions being the alleys, porches, and chancel, which are laid with tiles designed by Messrs. Emley and Son, Newcastle. The whole contract has been executed under the direction of the architects by Mr. Lumsdon, of Jarrow. The sub-contractor was Mr. Nevin, South Shields. The stonework for the windows and pulpit was executed by Mr. Sparks, Jarrow.

NOEL PARK, TOTTENHAM.—New schools on the Noel Park estate, erected for the Tottenham School Board, were opened last week. The schools are in Gladstone-avenue, and have been built by Mr. Charles Wall, of Chelsea, from designs of Mr. C. Bell, of Cannon-street, the contract being for £12,963. The buildings are in three departments. The infants' school on the ground floor accommodates 600. There is a large schoolroom and five classrooms of varied sizes, a wide corridor connecting the two parts of the building and serving as an assembly hall. The girls' school, to accommodate 400, is on the first floor, and consists of a large school and four class-rooms, a cookery kitchen and sewing-room. The boys' school, with six classrooms, is on the top floor, and is planned for 500 boys. There are also masters' and mistresses rooms, cloak-rooms, and offices. The warming is by the hot-water system. All the staircases and landings are of stone, the school and classroom walls of plain brickwork distempered, with match-boarded wall linings 4ft. high.

SEACOMBE, BIRKENHEAD.—The new church of Our Lady of the Sea and St. Joseph, Wheatland-lane, Seacombe, was opened on the 28th July. The church on plan consists of a nave, north and south aisles, and a chancel to the east, between which and the presbytery are placed a side chapel and the priests' and boys' sacristies. The total length of the church is about 140ft., and the height from floor to ridge about 60ft. The nave walls are arcaded with pointed arches, supported on Runcorn stone columns, having moulded caps and bases. Above, the nave arcade supports a lofty cerestory, pierced with lancet windows. The chancel walls and roof correspond in height to those of the nave, and being treated with an apsidal end, and lighted by three tracery windows, a richer effect is aimed at in the chancel than is produced in the other parts of the church. The roof timbers throughout are of strong dimensions, the principals being of an arched form, and the ceiling arranged in panellings over its entire area. The roof to the sanctuary is groined in wood. The confessionals are placed on the north side of the north aisle in a double transept, lighted from above by two large rose windows. The floor of the nave and aisles is laid with wood block flooring, and that to the chancel with parquetry, of geometric design. In the responds of nave arches next chancel arch are placed two niches, inclosing statues of the Blessed Virgin and St. Joseph, designed by the architect, and executed by Mr. R. L. Boulton, sculptor, of Cheltenham. The walls generally are built of local stone; the quoins, window and door dressings, plinths, strings, and labels are of Runcorn red stone. The roofs are covered with slate, finished with red tile ridge. All the windows are filled with plain red quarry glazing, proper provision being made for ventilation. A temporary brick wall has been erected at the west end. The contract has been carried out by Mr. John Shaw, 11, Priory-street, Birkenhead. Mr. H. L. Whittingham has acted throughout as clerk of works, the architect being Mr. Edmund Kirby, F.R.I.B.A., Liverpool.

CHIPS.

In Tuesday's list of receiving orders in bankruptcy, the name occurs of F. A. Dovey, Burrage-road, Woolwich, architect at Woolwich Arsenal.

All Saints' Church, Brill, was reconsecrated by the Bishop of Oxford, after restoration, last week. The works include a new south aisle, the rebuilding of the north aisle, and extensive works to the nave, which has been reroofed and reseated with chairs. A new south porch of stone and timber has been built, the arcades are reconstructed, and the floors laid with wood blocks. An eagle lectern, formerly in Bourstall Church, has been introduced. Mr. J. Oldrid Scott, F.S.A., was the architect, and Messrs. S. Orchard and Son, of Banbury, were the builders.

A new pulpit, designed by Mr. Reginald G. Pinder, of Bournemouth, was dedicated last week in St. Michael's Church, Bournemouth. The cornice, book-desk, canopy, and body of pulpit are of alabaster, the sculptured panels of white alabaster, and the central base of red Ogwell stone. Messrs. A. W. Blackler and Son, of Torquay, executed the work at a cost of £300.

The town council of Devonport have adopted plans by Mr. James C. Inglis, C.E., for a landing-pier to be constructed at Mutton Cove, in the Hamoaze, and for which a provisional order has been obtained. The pier will be 75ft. in length and 20ft. in breadth, and will be constructed of concrete, with granite copings and steps.

The first statutory meeting of the trustees under the order for the construction of a harbour at Balintore, Ross-shire, was held on Wednesday week, when the clerk submitted a report by Messrs. Stevenson, engineers, Edinburgh. They estimated the cost of the harbour works at about £6,200 for the east pier, and £1,400 for the breakwater—or a total of £7,600.

A new promenade pier, which has been erected at Boscombe, an eastern suburb of Bournemouth, was opened on Monday by the Duke of Argyll. The pier is 600ft. long, 38ft. wide at the head, and cost £12,000.

A group of public baths are about to be constructed in Truro, a site in St. Mary's-street having been acquired for the purpose, and Mr. Silvanus Trevail appointed architect.

Brunswick Wesleyan chapel, Moss-street, Liverpool, the "cathedral of Methodism" in that city, was reopened last week after restoration and internal decoration in colour. Messrs. G. H. Morton and Son, of Liverpool, carried out the works from plans by Mr. G. H. Morton, jun.

Engineering Notes.

Ramsey, Isle of Man.—A large swing-bridge is being constructed across the harbour for the Ramsey Town Commissioners. The approach from the town end is opposite East-street. The opening portion, consisting of two bowstring lattice girders, 207ft. 6in. long, will be supported at each end when closed by two cast-iron cylinders, 5ft. diam., carried down through the silt and warp to a bed of hard compact gravel, 35ft. below the bed of the harbour, and filled with concrete. The centre pier, upon which the bridge is to swing, will be built of limestone ashlar, the foundation and hearting being of concrete, which will be carried down to the same depth as the cylinders by means of a wrought-iron caisson, consisting of an inner and outer shell, stiffened and braced together by a network of lattice girders placed both horizontally and vertically, the former circular on plan, and placed every 8ft. apart. Connecting the two shells together are fifteen vertical lattice girders, which are expected to give great stiffness to the caisson. It was originally intended to carry the foundations for the centre pier only 11ft. below the bed of the harbour; but borings made by the contractor and verified by Mr. Vivian, C.E., of Whitehaven, showed a treacherous stratum of warp and alluvial deposit to exist at that depth, so it has been finally decided to go the extra depth. The diameter of the outer shell of the caisson is 36ft. 9in., and that of the inner one 26ft., leaving an open annular space of 5ft. 4½in. all round, which will be filled with concrete, and thus serve to weight the caisson as it sinks, while the interior of the inner caisson is being excavated by grabs or other appliances and divers. The caisson has a cutting edge formed by riveting a steel ring, 9in. deep by 2in. thick, to the edges of both shells, which are drawn in together at the bottom. The fixed portion of the bridge is carried on eight pairs of 20in. diam. screw piles, the longitudinal distance apart of these being 36ft. and the transverse distance 17ft. 9in., centre to centre, the total length of the bridge from end to end being 516ft., and will have both a carriage and footway. The caisson was only decided upon on the 1st of June, and was made, shipped, and delivered at the site by the 13th July. The bridge, which is progressing very rapidly and satisfactorily, is expected to be finished by Feb., 1890, and will cost about £16,000, and when completed will connect the old and new portions of the town, forming an easy approach to the Monagh building estate, park and lake, and promenade nearly a mile long, being a grand scheme for developing Ramsey into one of the most attractive seaside resorts in the kingdom. The whole of these works are being undertaken by the Ramsey Town Commissioners at a cost of over £40,000. Mr. T. J. Shilley, A.M.I.C.E., of Westminster Chambers, is the engineer, and the Cleveland Bridge and Engineering Co., of Darlington, the contractors for the whole of the bridge, the work being carried out under the supervision of Mr. F. T. Rednall, of Bury St. Edmund's, as resident engineer, the resident agent for the contractors being Mr. C. J. Coulson, M.S.A., of Ramsey.

SCHOOLS OF ART.

The Crystal Palace.—Mr. Edwin Long, R.A., and Mr. G. A. Storey, A.R.A., have adjudged the premiums for work produced by lady students in art of the Crystal Palace Schools, and there was on Saturday an exhibition of paintings, drawings, and models in the studio. The silver medal for water-colour painting (landscape) was gained by Miss E. Davie, and Miss Florence E. Bradshaw received a certificate for a sketch from nature on the Terrace. Miss Dora Dean and Miss M. C. Thurburn gained severally the silver medal and the certificate for water-colour painting from the living draped model posed for pictorial effect. Miss Fanny Way gained the silver medal for drawing from life, and the like prize for painting in oils; while the certificate for drawing was given to Miss Berta Ohlenschlager (who held the scholarship last year) for a drawing of Michael Angelo's Madonna. Miss M. E. Grose took a certificate for oil painting, and Miss D. White the certificate for modelling, and to this last-named lady was awarded the scholarship in art.

COMPETITIONS.

Newcastle-on-Tyne. — The information furnished us last week by correspondents as to the awards in the competition for the two new police-stations was incomplete, and we now give full particulars. Plans for two sets of buildings were invited—one a police station to be erected in Elwick's-lane, the other a police and fire-brigade station, to be built on Arthur's-hill—and Mr. James Murgatroyd, F.R.I.B.A., of Manchester, was appointed assessor by the Newcastle corporation. At their meeting last week Mr. Murgatroyd reported that he had placed in position the following plans, which he had selected out of a large number sent for his examination: For Elwick's-lane Police Station, "Custos," 1; "G. C. D.," 2; and "Truth," 3. For Arthur's-hill Police and Fire-Brigade Station, "Truth," 1; "Adrian," 2; and "G. C. D.," 3. In accordance with the recommendations of the assessor, the committee selected the plan of Mr. J. S. Quilter, London, who had signed himself "Custos," for Elwick's-lane Station; and the plan of Messrs. J. and A. C. Houston, 28, Essex-street, London, W.C., whose *nom de plume* was "Truth," was chosen for Arthur's-hill Station. It was agreed to divide £50 between the second and third competitors for the two buildings. "Adrian" (Messrs. Clark and Muscroft, of Darlington), received £12 10s; "G. C. D." (Mr. A. D. Gibson, of Newcastle), who was second in one and third in the other, to receive £25; and "Truth," who was second for Elswick-lane building, to receive £12 10s.

Richmond, Surrey.—At a meeting of the Richmond vestry held on Tuesday, a report was submitted by the works committee on the eight sets of plans received for the proposed new Municipal buildings. They concurred in the recommendation of Mr. James Edmeston, the architectural assessor, in proposing for adoption the design marked "Q. E. D."; that marked "Westward Ho!" being placed second. They accordingly recommended that the first premium of £100 be awarded to the author of "Q. E. D.," and the second premium of £50 to "Westward Ho!" Mr. Edmeston's report was read as follows:—

"The competitors generally deserve the thanks of the Vestry for the painstaking way in which they have endeavoured to observe and carry out the instructions laid down for their guidance. As regards all four of the designs under the mottoes 'Stet,' 'Syenes,' 'Nota Bene,' and 'Rules,' the general arrangement of plan (which should be the first consideration), the lighting of corridors and staircases, the non-interference with ancient lights, economy of space, &c., is not equal to the treatment adopted in the four remaining designs under the mottoes 'Q.E.D.,' 'Westward Ho,' 'Bon Espoir,' and 'Concilium,' the three last of which are of very nearly equal merit, necessitating the closest consideration. I put 'Q.E.D.' first: The plan is simple and compact, with little waste space; every part is well lighted; ancient lights have been carefully considered, and the cost, which I take to be an important item, would be much less than in any of the three last named. I put 'Westward Ho' second: The arrangement of plan is excellent. Architecturally, the design is in some respects superior to 'Q.E.D.'; but the cost would considerably exceed the stipulated amount, and but for this I should have placed 'Westward Ho' first. The competitor who contributes designs under the motto of 'Bon Espoir' furnishes a plan good in many respects, but not quite equal to the two above named. This observation does not apply to the elevations, which are delineated in drawings of exquisite finish. The whole set of drawings under this motto are indeed very complete and carefully considered. The same remarks apply to the good and well-illustrated designs submitted under the motto 'Concilium,' neither of which could be erected for the same sum as 'Q.E.D.' In all these four designs the warming and ventilation are properly provided for. Nothing appears in either of them likely to be detrimental in an acoustic sense. The instructions state unless the building can be carried out for £10,000 or 10 per cent. beyond, the competitor will be disqualified from receiving any premium. It appears to me, however, that the accommodation required by the instructions could not be properly provided in a suitable building for the sum named, so that this stipulation might be, in fairness, relaxed. Finally, so far as I am concerned, the directions prohibiting canvassing have been observed by the competitors. I have not the least idea who they are."

The report having been approved, it was found that the design marked "Q. E. D." was by Messrs. George Elkington and Son, of 95, Cannon-street (the architects for the Richmond public baths), and that marked "Westward Ho!" was by Mr. Thomas Verity, of 11, Jermyn-street, S.W. The whole of the plans will be on view during the ensuing week at the premises of Mr. F. Piggott, George-street, Richmond.

The church of St. Peter's, Great Toller, Dorset, is about to be restored, from designs and under the superintendence of Messrs. Taylor and Gordon, architects.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Cellar. (Go to Hayward Bros. and Eckstein; the other things you mention are of no use.)

Received.—F. C.—J. A.—H. Bros. and E.—T. T. and Co.—B. of E.—J. P. and Son.—H. and T.—J. D. and Son.—C. C.

Correspondence.

THE ARCHITECTURAL ASSOCIATION.

To the Editor of the Building News.

Sir,—Your readers will, I have no doubt, have heard with satisfaction of the timely step the newly-elected Committee of the Association have taken in immediately dealing with the educational question, by delegating to a special committee the consideration of so grave a matter, which not only materially affects future generations of architects, but is in itself a question of national importance.

It is, I believe, universally admitted that the voluntary system has done a great work, and it is to be hoped that the day is far distant when its great value in so many ways will be overlooked.

However, those who are closely associated with the working of the Association will not, I think, fail to come to the conclusion that, owing to the great amount of work and number of members, which increase yearly, the Association has become unwieldy as regards the inadequate provision made for its successful management. It is undoubtedly a most gratifying fact from one point of view to those who have helped to build the Association from its foundation, forty-seven years ago, to its now magnificent proportions, to find that this is the case. But it cannot be satisfactory to them, or to members generally, to know that an association which already holds a powerful position, and is capable of exercising an enormous influence on the future architecture of the country, is likely to languish unless its condition is now seriously and boldly dealt with from a national point of view.

The broad spirit in which it is necessary that the matter should be taken up cannot be overestimated as affecting the result. And as I

believe the Special Committee appointed to deal with this question is composed of thoroughly competent men representing all sorts and conditions of thought, we have every reason to hope for the best possible issue resulting from their united efforts and arduous labours. It is not, perhaps, out of place to make a few suggestions which may have occurred to others as well as to myself, the first of which is that some recompense should be made to the secretary or secretaries of the future. It is too much to expect any architect to undertake work in which such a vast amount of time and trouble is involved, without some reasonable remuneration, in lieu of the nominal sum which is at present granted towards the salary of a clerk.

As regards the various classes which are connected with the Association, I believe there is a strong feeling that the existing regulations and method of conducting them require totally revising and starting on a new basis. Then there are several subjects which might be taught with great advantage to students, who will learn with satisfaction that the committee have already acceded to the request that more visitors should attend some of the classes to facilitate arrangements, and complete with greater despatch their inspection of students' work.

But the question of more classes involves another great consideration—viz., the inadequate accommodation which many think already exists, and which would become intensified in that case. And now that the clauses concerning a new course of examination have been passed by the R.I.B.A. Council, the nature of which appears to be somewhat far-reaching as regards the wide range of subjects it comprises, and which in itself will be an examination of a much higher standard than heretofore, does not the thought present itself to the minds of your readers, as to the great want that is now and will be felt for a definite, concentrated, and organised centre—where the knowledge which is required in order to successfully enter the examination lists may be obtained? An inquiry into the systems of foreign countries would be of great value, a step which I have no doubt the Committee will think it advisable to take. The fact that over 800 members of the Association reside in London should be a most powerful argument in favour of having a home of our own, a building of our own, and an educational course of study and thorough system of management worthy of our members, of our profession, and of the high standard which it ought to take. When we consider for one moment the names which have shed so great a lustre on the profession in times gone by, and the men of to-day who have been the pioneers of so much progress and the authors of so marvellous a revolution in the architecture of the last 25 years, surely they will rise to the occasion and assist, in whatever way they are able, to place the Association once and for ever on a solid, broad, and satisfactory basis.

With London as the centre, a great work could be effected in the provinces. The affiliation of the architectural associations of other cities and towns could be brought about with mutual advantage to all, and with this intention my impression is that a tour of many of the largest cities and towns might be made with great advantage to bring about such a desirable result. The advent of the president and secretaries of the Association, in company with the president and the honorary secretary of the Institute, if the latter gentleman could be persuaded to entertain this idea, would, I imagine, have a wonderful result in swelling the roll of membership, affiliating existing associations, creating local branches, and bringing members of the profession in all parts of the country in touch with the London centre to a much greater extent than now exists.

Among others the following places might be visited: — Cambridge, Nottingham, Lincoln, Sheffield, Huddersfield, Wakefield, Hull, Leeds, York, Durham, Newcastle, Edinburgh, Glasgow, Carlisle, Bradford, Manchester, Liverpool, Dublin, Birmingham, Cardiff, Bristol, Bath, and Oxford.

At the first glance, to many I have no doubt this suggestion may appear too far advanced. But if an attempt is to be made to raise funds for educational and building purposes, I imagine that local committees might be formed among the architects with a few leading townsmen and the mayor, and through them a public appeal might be made in the country, which I am confident would meet with a great deal of pecuniary support.

So far as London is concerned, the right way would appear to be to appeal to our senior body, the Royal Institute of British Architects, for patronage and support, also to architects generally; and then to the public through the columns of the *Times*, *Standard*, *Daily Telegraph*, *Daily News*, *Morning Post*, *Daily Chronicle*, &c. This appeal should be preceded by a meeting together of eminent men in the world of art and literature, for which purpose the Prince of Wales, who has always proved himself a firm supporter of schemes for the welfare of the community, might be induced to preside, and the patronage of Her Majesty obtained to give the matter the publicity and patronage which are so essential in such cases.

Ecclesiastical patronage generally could, I think, be reasonably hoped for; and if the earnest co-operation of the various City guilds and companies could be obtained, this would augur well for the success of the scheme.

The Royal Academy should be approached for co-operation, the Society of Arts, and the many other influential societies associated with architecture. Then as regards the amount to appeal publicly for. Let me earnestly plead that it may not be made without due consideration as to what we really require.

We have a great cause and a grand opportunity for appealing to the public. And if we are to have a building of our own, let it be of a sufficiently attractive and useful nature, providing at the same time a centre for educational work and embracing something of a social and possibly residential nature, where we may hope to enlarge the sphere of our usefulness and cope with the matter successfully. The fact that a few years ago nearly 200 architects joined one London club alone, *en masse*, would seem to support this idea. We shall require a certain number of paid instructors as well as those who give their services voluntarily; we require a paid secretary; and if we may hope to found scholarships in connection with the Association, and also to support instructors in the country, our appeal must be at once for £50,000, if not more. If British people are prepared to give money to innumerable subscriptions for providing funds in support of every imaginable object in all parts of the world, I am convinced that we also will be able to appeal with excellent results. But we can only hope for this by, in the first place, knowing exactly what our wants are; by not fearing to ask for a large sum, and by a system of complete and magnificent organisation—in fact, a well-prepared plan of campaign.

I should suggest the immediate neighbourhood of Trafalgar-square as the most suitable position for our headquarters, and removing there as soon as our funds warrant our even temporarily renting a suitable building. There is undoubtedly a sympathetic feeling among the Council of the Institute, and it will cause an immense amount of satisfaction if that body generally respond in an encouraging manner to an appeal now made to them.

It might be possible to organise an exhibition and sale of works of art in all its branches during the next or following London season, to which, amongst others, craftsmen might be induced to send examples of their several arts. This would provide funds towards expenses, and create considerable interest in our welfare.

May I, in conclusion, express a hope that this scheme, which is of an elastic nature, will be the means of arousing the enthusiasm of architects generally to the nature of this appeal, which I have had the opportunity of discussing with several members of the Committee, who have expressed themselves favourably as regards many of the suggestions it contains? When the public see a united effort among the profession generally to improve their condition, we may hope to arouse a philanthropic spirit among the men of wealth and intelligence throughout the country.—I am, &c.,

London, July 25. Arthur W. Earle.

COUNTY COUNCILS AND SANITATION.

Sir,—Will you favour me by permitting a short statement as to the present condition of many of our populous villages and other places? It is in by far the greatest number of instances that the sanitary authority expend all their possible ingenuity to defer and put off all reformation, and that many of them deem it very clever to shut their eyes, their ears, and their noses, and to button up their breeches pockets against all sanitary reform. Any sort of an excuse is resorted to so as to insure further delay. Medical officers may report in the strongest terms possible, the authority, amid much wriggling, cannot deny urgent necessity, but some sapient member is always ready to move "that the consideration of the matter be deferred for a month"; this is readily seconded and carried unanimously, and there is at once a feeling of relief and a sort of questionable sense of *something* having been done. I could give a score of instances to prove what I write. I can point to a small town in Lancashire where twenty years ago a spirit of sanitary improvement was aroused, and plans for drainage were prepared; meanwhile the demon of delay came upon the scene, and triumphed. The town has grown, its sewage pollution increased, and nothing has been done. The question is, What will the County Councils do? Will they stir up a systematic effort and insist on something practical, or will they also drift into the sleepy do-nothing condition? My own opinion is that a competent sanitary engineer should be appointed over a certain area, as county bridge masters and road surveyors are appointed, that he should inspect and advise upon needful works of water supply, drainage, and other practical works, and that he should see to these being carried out. The advising engineer might have a district embracing an area of many square miles, and including half a dozen villages or populous places, and the County Council should be his paymasters. Such a plan would be much better than having an indifferent and poorly paid man at each place, who could originate nothing, nor would venture to press anything upon those from whom he received his wages. A central advising head is wanted, to whom all sanitary matters would be referred, and the salary of such a man divided amongst the places under his jurisdiction would be a very cheap arrangement. If anything is to be done in rural places, we must have somebody above the ordinary nuisance inspector at £1 or twenty-five shillings a week, to whom we can look and who will not be afraid to speak his mind, and not permit the "adjournment for a month" farce to go on for years, as in too many places it has done. Is it not fully time that, whilst education is being pushed and pressed and crammed into every brain crevice, the knowledge of and the enforcing of health necessities and life problems should cease to be so much ignored and neglected?—I am, &c., Sanitary Engineer.

ST. ALBAN'S ABBEY.

Sir,—Just one line, please, though I fear both you and your readers must be growing tired of this correspondence. Messrs. Longmire and Co., while endeavouring to ostracise me for assisting in exposing the hollowness of their charge about the incorrectness of your lately published sheet of "contrasts," utterly fail, as I knew they must, to show in what detail or particular these drawings are wrong. Judgment goes necessarily by default. I do not fancy, from the position I hold at the R.I.B.A., that the members are "thoroughly ashamed" of me, seeing that by the popular vote of the members I was elected: but of that no matter. At least I have no monetary interest in the demolition work at St. Alban's, and as for "Ars'" sneer about my "boasted knowledge" of the Abbey, it may interest him to know that years ago the late Mr. Longmire personally showed me over the building, and explained what the then Sir Edmund Beckett was going to do. The great man himself, too, has conversed with me on the same subject, as well as his clerk of the works, the late Mr. Chapple. From first to last Lord Grimthorpe's work deserves all that architects have said of it. I challenge Lord Grimthorpe, or his friends, to name any dozen persons (architects, painters, or others) well known in the art world to publish an approval of the rebuilding carried out by him. I certainly never heard anyone myself say a good word for it, except those who were personally interested in furthering the process. No wonder the amount of money spent by Lord Grimthorpe pleases them, and they may well be "proud to be in such company." Where is the church architect of any reputation who will say that the work is good? and surely architects ought to know as much about this question as clerks of the works (Irish or otherwise), or builders, or parsons.—I am, &c., F.R.I.B.A.

MARTYRED ST. ALBAN'S.

Sir,—The poet rightly says that "a little knowledge is a dangerous thing." It is not only so, but in its determinedly fussy parade of small smattering it makes itself most objectionably offensive. What nonsense such amateurs as "Ars" and "Country Curate" write! With their preaching and pother one might suppose that we architects knew nothing—ignorant even of the details of our own business, and they think they can teach us! "Ars" a week ago exaggerated the expenditure of the would-be-thought architect to £80,000! My opinion is that the Destructive-one has not that sum to part with, and that one-fourth of that amount is a reasonable sum at which to appraise his work of uglification. We know that his principal, and ever to be lamented, doings are the rebuilding of the west end of nave and the south end of transept, and I consider that £20,000 would be ample for that, and leave a good margin for other pottering. The "Would-be" is not such a simpleton, I believe, as not to know when he has his money's worth, and between you and me, Mr. Editor, he has done very well. Many men, I believe, would give £40,000 or £50,000 to be made a baron—barren though such title must needs be. But no matter. If the "Would-be" did not, however, in this matter look after his own interest, and the expenditure was half as much again as I have named—and we admit the possibility of the cost being £30,000—then as men of business, I take it, we cannot go a bit beyond. How many surveyors, architects, and worthy builders there are would like to undertake such amount of work for such price! I met with an illustration of the impracticableness of this boastfully-practical man, who would be "lord of all," in a small "History and Guide-Book of St. Alban's." There is not an author's name on title-page, but as much space is occupied by the writer's eulogium on his own cleverness, and spiteful remarks on Messrs. Street, Scott, and other architects, the author stands revealed—the grim goblin of the martyred Fane! This is the passage that caught my eye—he is speaking of one of the piers of nave:—"It was cracked through, and the wall above it up to the top of the clerestory, and swallowed seven tons of cement poured in from the top, besides I don't know how many tons of new stones, both inside and out." Now, Sir, there must needs be to seven tons of cement about three times as much water, and I should suppose some sand, making something like thirty tons altogether, equal to, say, 30 cubic yards, and besides which some tons of stone, all to be got into a crack in the wall! Can you imagine, Sir, how this was done? The problem of getting a quart of liquor into a pint pot is nothing to it—this being the filling of a pier which already is full with double the quantity of material which it originally held! Of course it is possible the weight of cement specified was liquid. If it was it should have been so stated; but even with this reduced quantity, though the wonder is less, the possibility is not increased. No architect could have done such a marvellous thing—ergo, the *doer* is cleverer than any architect, and so he believes.—I am, &c.,

M.

FLEXIBLE TUBING.

Sir,—Anent your recent article on "Flexible Metallic Tubing," the time has not arrived for us to consider its merits or disadvantages, on both of which issues, however, there is much to be said; but we think your readers should become aware of the fact that indiarubber tubing is not by any means played out, or likely to be superseded by this new tubing. On the contrary, our patent process of covering indiarubber and other hoses with a steel-wire armour renders them practically indestructible, and should permit of their lasting in constant use some thirty or forty years, enabling the hoses to resist successfully the highest steam and water pressures that can be employed for any industrial or mechanical purpose whatsoever.

We have made and supplied hydraulic hose capable of resisting 10,000lb. internal pressure on the square inch, and our hoses have also successfully resisted 500lb. of steam. We should like to see any flexible metal tubing submitted to similar tests, with equally satisfactory results; and what would become of the flimsy strips of indiarubber of which the joints consist, and which are indispensable to give the flexibility to what would otherwise be nothing more nor less than an ordinary iron pipe?

We are disposed to substantiate our statements in any practical way that may suggest itself to those responsible for the advantages claimed for this metallic hose, to the utter ignorance of the existence of a hose which has long monopolised the trade, and will still hold its own for the multitude of purposes for which a flexible hose is now in demand.—I am, &c.,

F. Marten Hale,
Secretary and General Manager, Sphincter Grip Armoured Hose Company,
63, Fore-street, E.C.

ALL THE DIFFERENCE.

Sir,—We notice in your impression dated July 26th, 1889, you publish a list of tenders for rebuilding No. 29, Hereford-street, Mayfair, and state that our amount for Portland stone is £1,500 extra; our estimate amounted to an extra of £15 only. We shall feel obliged by your correcting this in your next issue.—We are, &c.,

Higgs and Hill.

Crown Works, South Lambeth-road,
London, July 31st.

Intercommunication.

QUESTIONS.

[10052.]—**Easements.**—Has the law relating to easements been altered lately? A solicitor told me recently that twelve years were not sufficient to acquire a right.—M. S. A.

[10053.]—**Cesspool.**—Can any of your readers inform me what is the cheapest and best mode of purifying the overflow of liquids from a cesspool? I am obliged to filter in order to obtain permission to take overflow into a village drain. Will a gravel filter be effective?—T. G.

[10054.]—**Coloured Concrete.**—Would some reader be so good as to inform me what is the name and nature of the material used in colouring concrete, say to a red or grey granite, or Arbroath stone colour, and the proportion of material used? Full particulars will oblige.—James Smith.

[10055.]—**Marine Houses.**—Will anyone give his experience with a view to dry houses near to and facing the sea, which have been built with shingle and a small quantity of sea-sand and Portland cement mixed with sea-water—whether it is safe to use sea-sand and grit with cement for outside plastering, fresh-water being used for both inside and outside plastering?—D. B.

REPLIES.

[10039.]—**Right of Way under the Altar.**—Thanks to your correspondents for their answers to my query about the Hythe Church "crypt," but neither reply seems satisfactory. "M.'s" idea that it was built as an ossuarium, is, I fancy, a mistake; while the fact that only a very few of the skulls and bones there now are those of females, upsets his notion as to the grave-diggers of succeeding generations having collected them from the churchyard in the ordinary course of their business. The remarkable richness and beauty of the architecture of this so-called crypt seems to indicate another idea altogether, and I thought som one better versed in such matters might enlighten us on the subject. Dr. Lee, I notice, is one of your frequent contributors, and ought to be able to help us. The "crypt" is the wrong way about for a chantry chapel, and the doors, one at each end, are against such a solution. In plain terms, it looks like a handsome passageway with steps outside down to it, with large rich doorways, with the churchyard at a higher level all round, and room to pass the end of the chancel in the churchyard. What could this passage be for? That is still my query. —Churchman.

[10039.]—**Right of Way under the Altar.**—"Ars" has no knowledge of the subject. The supposed right-of-way theory may be common; but it has not a tittle of evidence in its favour. "Ars" does not appear to know what "right of way" is. In his idea it is a right to walk round the church—to wander about. There is no such right. Right of a way only exists where a path or public thoroughfare has been made across land, as a way from one place to another, and the right of the public is confined strictly to that path. In towns where such path crosses a churchyard, it is customary to fence the sides and keep people from going round the church, and where such path does not exist the whole churchyard is often closed to the public. So much for public right. Wherever, as in cases named, the boundary-line of the burying-ground comes close to the church, it may reasonably be assumed that a portion of churchyard has been cut off. This has happened in innumerable cases. In London and other cities we see not only churchyards clipped, but the whole of the yard sacrificed, and not unseldom the churches go too. A few years since I remember a slice being taken from the churchyard of St. Giles in the Fields. So the matter of boundary-line proves nothing for the right-of-way theory. In early times land was not of such value as now, and people were ready to endow the church liberally. They gave a full sufficiency for the churchyard, and naturally, according to the dictates of common sense, the church would be placed somewhere about the middle of the plot. If a right of way existed along one side of the ground, is it likely the builders would be such fools as to put themselves to the trouble and expense of placing their building at the extremity of the site and over such right of way, all to their own detriment? Such idea is most absurd. Moreover, if they wanted to place their church where a right of way existed, it would have been a very easy matter to divert the path a little a-oneside. The church authorities were omnipotent, and the rights of the pedestrian serfs not worth much. If right of way—*i.e.*, a public thoroughfare—ever existed across a churchyard, it would in all probability continue now, and show itself beyond the churchyard's limits. The facts, however, are plain and patent. No such right ever existed, and had there been such, as a matter of common sense, the chancel would not have been erected over it. Those who are interested in the subject will find reliable information in Parker's "Glossary," last edition, under the head of "Charnel-house," and in Viollet-le-Duc's "Dictionnaire," under "Ossuarium."—M.

[10044.]—**Churches with Chancels not in the same Axis.**—Some of your correspondents may not be aware that a theory has been advanced to account for the frequent instances of the chancel walls or of one wall diverging from the true east and west direction of the axis of the church itself. It is suggested that where the divergence is found, it is in the direction from which the sun actually rose on the patron saint's natal day. This I understand has been verified in some of the older of the Sussex churches—Bolney for example. Should this be the case universally, one easy test might be applied. Whenever the divergence is to the southward, the saint's day should fall between the autumn and spring equinox; whenever to the northward, it should fall between the spring and autumn equinox. I, among others of your readers, would be interested to learn the experience of your correspondents on this subject.—C. Seth-Smith, 4, King's Bench Walk.

[10047.]—**Cottage Hospitals.**—The best book is "Cottage Hospitals," by H. C. Burdett, and the price is, I think, 14s. For plans refer to back volumes of the "B.N."—H. L.

[10048.]—**Eaves Boards, &c.**—A "lear board" is the board at the side of a lead or zinc gutter; an "eaves board" is the board to finish the eaves. The use of a tilting fillet with a splayed eaves board must depend upon circumstances, but can generally be dispensed with.—H. L.

[10049.]—**Ancient Lights.**—I should not care to contest a case where damages were claimed for obstruction of a small part of the light of a greenhouse: it would be difficult to obtain an injunction.—H. L.

[10051.]—**Insects in Wood.**—I have not heard of an experiment; but allow me to suggest well dusting the holes with pyrethrum powder, to be obtained at any chemist's.—H. L.

CHIPS.

The parish church of Manby, Lincolnshire, has just undergone extensive restoration under the superintendence of Sir Arthur W. Blomfield, architect, the work being executed by Messrs. Rudd and Son, of Grantham. The chancel has been partly rebuilt, and the oak roof, hitherto covered by a plaster ceiling, brought to light; the chancel arch has been rebuilt, the staircase to the rood-loft, hitherto blocked up, being thereby exposed. A new oak door has been placed at the foot of this staircase, and also a new north door to the church, with ornamental strap hinges. The seats in the chancel are of oak, with wood-block floors, and the remainder of the floor is of Minton's tiles. A pair of seven-light wrought-iron candelabra, a panelled altar in wainscot, and an oak lectern are among the special gifts. About £600 has been spent on the work of restoration.

The Jessop memorial fountain, Endcliffe Woods, Sheffield, has just been completed. It consists of a stone base, the upper part of tracery and carved work in English oak, and the roof is tiled. The fountain is of bronze, enriched with quaint figures, and having copper drinking goblets. The floor is black and white marble, and on each side of the fountain seats are fixed. Messrs. Bissett and Sons have executed the wood and stonework, Messrs. Longden and Co. have cast and finished the fountain; the modelling and carving has been done by Mr. F. Tory, the design is by Mr. Thomas G. Edwards, Davy's-buildings, Fargate, Sheffield, and the work has been executed under his supervision.

A new Wesleyan chapel was opened on the 25th July at Pelynt, near Looe. It replaces a chapel built in 1814, measures 60ft. by 32ft., exclusive of schoolroom at the end, and is fitted with pitch-pine open seats. Mr. James Hicks, of Redruth, was the architect, Messrs. Lane and Coss, of Looe, were the contractors for masonry, and Mr. Slade, of Pelynt, executed the carpentry.

St. Mary's Church, Ilminster, is about to undergo alteration, the scheme including the provision of new seats, heating apparatus, and organ, at an aggregate cost of about £1,500. Tenders have been accepted for carrying out the work under the direction of Mr. J. D. Sedding, of London, the diocesan architect.

The directors of Lossiemouth Harbour Company have recommended the deepening of the harbour. They propose acting on a report by Messrs. Stevenson, engineers, Edinburgh, to deepen it to the extent of 6ft. below low-water mark at an estimated expense of £20,000.

Mr. John Heywood, of Deansgate, Manchester, has been intrusted with the complete furnishing of the new technical schools, Stockport; Lowe Mosley-street schools, Manchester; Free Library Denton; St. Alphonsus' R.C. School, Liverpool All Saints' R.C. Schools, Barton, near Manchester and Taxal Church, near Whaley Bridge.

LEGAL INTELLIGENCE.

Lord Coleridge on Architects' Charges.—At the Essex Summer Assizes held at Chelmsford on Monday, the action Whitmore v. Crabb, Veley and Co. was tried before Lord Justice Coleridge and a special jury. It was brought by Mr. Frank Whitmore, architect and surveyor, Chelmsford, to recover £126 19s. 6d. for work done by plaintiff for defendents, a firm of brewers, at Great Baddow, near Chelmsford, in preparing plans and specifications and superintending works and repairs to publichouses and other property. Defendants questioned the fairness of the charges, and while repudiating their liability altogether, paid £43 14s. into court in satisfaction of the claim. The chief point at issue was as to whether the instructions given plaintiff by Mr. A. C. Veley were binding on the other defendants. Plaintiff's counsel, Mr. Willis, said he regretted having to bring an action against Mr. F. T. Veley, who had lived in Chelmsford for many years, first as a solicitor, and afterwards as the principal partner in this extensive brewery. It was by reason of differences between Mr. Veley and his son, Mr. A. C. Veley, that this action was defended. After hearing counsel, Lord Coleridge intimated that he should not accept the dictum of the Royal Institute of British Architects in the matter of charges. He should not allow this or that percentage as customary, but should go upon the principle of *quantum meruit*—architects should be paid like other people. Later on, referring to the preparation of quantities, his Lordship said his idea was that it was the duty of the architect to prepare everything necessary for the builder to tender from. He wanted, if possible, in a court of law to get everything back to correct principles. He disallowed ½ per cent. debited for receiving tenders; but with respect to other items he regarded them as very reasonable. Plaintiff said he had been in practice in Chelmsford for 17 years, and during the whole of that period had been employed by defendants' firm, and had been paid by cheques signed by Mr. A. C. Veley as "Crabb, Veley, and Co." He had superintended the rebuilding of the Rose and Crown, Chelmsford, and the partial rebuilding of the Hawk at Battle Bridge. His instructions subsequent to Mr. Smee's death in 1882 all came from Mr. A. C. Veley. The £126 19s. 6d. sued for was in respect of work in connection with a malting at Stock, the Bull Inn, Pitsea, and other publichouses. Mr. Murphy having opened for the defence, his Lordship intervened, asking: What about the Rose and Crown and Hawk? You can't get out of the question of liability. I can't allow all these items. Mr. Willis here offered to renew his offer made before the trial to accept £100 in settlement. This was agreed to, and the Judge said: You have made a sensible arrangement. Verdict for plaintiff for £56 6s. in addition to £43 14s. already paid into court.

The occasion of the visit of the Wesleyan Conference to Sheffield was deemed most suitable for the laying of a number of memorial-stones of (St. John's) Wesleyan Methodist Chapel, Crookes Moor-road, in that town, and the ceremony took place in the afternoon of Monday. Plans supplied by Mr. C. J. Innocent for the new chapel were adopted, the total outlay being estimated at £7,000. The buildings will include, in addition to the chapel, which, with galleries, will seat 800 adults, spacious vestries, classrooms and committee-rooms, a large band-room, infants' school, a ladies' room, &c. The contracts amount to a sum approaching £6,000, and have been let as follows:—Masonry, Mr. James Fidler, Eckington: joinery, Messrs. W. Crooks and Son, Division-street; slating, Mr. W. J. Tune, Attercliffe-road; plastering, Messrs. Carter, Unwin, and Son, Earsham-street; and plumbing, Mr. J. B. Corrie, Carver-street. The clerk of works is Mr. George Malpas.

A new industry promises the development of the stone quarries in North Wales—the utilisation of the waste stone for ballasting the permanent way of railway lines. Messrs. Darbishire, the proprietors of the granite quarries at Penmaenmawr, have entered into a contract extending over many years with the London and North-Western Railway Company, who contemplate using the material as ballast all along the Chester and Holyhead section of the line. To meet the demand, Messrs. Darbishire have made additions to their quarries, the new machinery being supplied by Messrs de Winton and Co., Carnarvon. The works were opened on Wednesday week, Mrs. E. Wood setting the machinery in motion, and Mrs. Darbishire starting the first couple of trucks down the new incline.

The corner-stone of the building now being erected at the back of the Baptist chapel, Bell-street, Romsey, for the Sunday-school, was laid on Wednesday week. The building now in course of erection consists of an addition of assembly-hall and class-rooms at the back of the chapel, which was built in the year 1811. The contract is in the hands of Mr. George Wheeler, of Romsey, and amounts to £350.

WATER SUPPLY AND SANITARY MATTERS.

Glasgow.—The piercing of the Mugdock tunnel through the hilly ridge which lies between the valleys of the Blane and Allander, in connection with the Glasgow Waterworks extension, has been successfully accomplished. The distance from Loch Katrine to Mugdock is 25¾ miles, of which some 11¾ miles are tunnelled through the hills. The first of these sections is from Mugdock to Strathblane, about 1¾ miles. The contract for this was undertaken by Messrs. Morrison and Mason, of Glasgow. The work was carried on at both ends. The distance bored from Mugdock end has been 1,340 yards, while from Strathblane the distance is 1,330 yards—in all, 2,670 yards. On Monday night a junction was made in the centre. The new tunnel is about 25 yards distant from and parallel to the old one, and will pass daily 70,000,000gals. of water, as against 42,000,000 by the present one. The tunnel is 1¾ miles in length, is without shafts, and has been driven from each end by compressed air machinery.

CHIPS.

After a lengthened investigation by an inspector in the town itself, the Local Government Board have sanctioned a scheme for the drainage of the borough of Margate, prepared by Mr. Baldwin Latham, C.E., and also have given their consent to the borrowing of £57,000 for carrying out the work.

On Thursday afternoon Viscount Lascelles opened a block of buildings which have recently been erected in a prominent position in Fargate, Sheffield, a portion of which has been built for the Yorkshire Penny Bank, the remainder being occupied by the Sheffield Café Company as a restaurant and first-class temperance hotel. The buildings were erected from the plans of Messrs. Perkin and Bulmer, architects, Leeds, at a cost of £19,000. They are six stories high, the style being Early Gothic.

On Friday the Commissioners of Helensburgh, N.B., drove to the waterworks and opened the new reservoir, constructed at a cost of over £5,000. The capacity of the reservoir is 28,000,000gal. Mr. Wilson, Greenock, was the engineer, Mr. Murray, Maryhill, being the contractor.

The Professorship of Civil Engineering and Mechanics in the University of Glasgow is likely soon to be vacant by the resignation of Professor James Thomson on account of failing health. Professor Thomson, C.E., LL.D., D.Sc., F.R.S., whose father was Professor of Mathematics in Glasgow University from 1832 to 1849, and whose brother, Sir William Thomson, is at present Professor of Natural Philosophy, was appointed to the chair of Civil Engineering and Mechanics in 1873, having previously occupied one of the Chairs in Queen's College, Belfast, for a series of years.

On Saturday the chairman of the Leith School Board laid the memorial stone of a new school now in course of erection for the Board in Couper-street, North Leith. The total accommodation is for 1,875 pupils. The architect is Mr. George Craig, Leith; the contractors for the mason and carpenter work being respectively Mr. William Baxter, and Messrs. Drysdale and Gilmour.

The members of the Yorkshire Archæological and Topographical Association made an excursion to Whitby on Wednesday week, the centre of interest being the ruins of the once famous abbey of that town. At the abbey they were met by Mr. St. John Hope, M.A., who gave a description of the ruins. The after-proceedings were presided over by the Rev. J. C. Atkinson, M.A., D.C.L., vicar of Danby.

A Parliamentary return relative to the Metropolitan Water Companies, shows the number of houses and other buildings supplied during the year 1883 was 659,249, and in 1887, 729,162, being an increase of 10·6 per cent. in the four years. The water rental in 1887 showed an increase in the total equivalent to 8·2 per cent., as compared with the year 1883. The half-yearly dividends paid by the eight companies varied from 7¼ to 12 per cent. In December, 1887, the estimated gross value of the total share capitals was £261,131,570, having increased during the four years by 5·6 per cent.

The Bishop of Salford laid, on Saturday, the foundation stone of an extension of Our Lady of Mercy House for the Aged at Culcheth Hall, Newton Heath. The new building will accommodate 250 persons, and will cost £7,000. It will include almshouses, an infirmary, and dormitories, and will be arranged on three floors. Mr. F. W. Tasker is the architect, and Mr. W. Healey, of Salford, is the contractor.

The memorial stone of Springburn North Free Church, Glasgow, which is to be erected at the corner of Springburn-road and Elmvale-street, Glasgow, was laid on Saturday. The church, which is to cost £5,000, will provide 900 sittings.

Our Office Table.

A new class is formed in connection with the Architectural Association—viz., the class for sketching and measuring up buildings in London and the neighbourhood. A preliminary meeting for this purpose was held at No. 9, Conduit-street on Monday, July 22nd, Mr. Leonard Stokes, the president of the association, presiding. There was a good attendance, and several rules were framed. A list of visitors was drawn up to be submitted with rules to the committee of the association. It is proposed to make fortnightly visits on Saturdays when vacation visits do not take place. The first visit will probably take place on Saturday, August 10th. Any further information required should be sought of Mr. Arthur W. Earle, hon. sec. pro. tem., 44, Mortimer-street, W.

The Vicar of Chilvers Coton, near Nuneaton, the Rev. Robert Chadwick, M.A., is appealing in the columns of the daily press for £600, half the estimated cost of restoring his church, which he asserts is the original of "Shepperton Church," graphically portrayed by "George Elict" in her "Scenes of Clerical Life." Chilvers Coton Church is, according to its vicar, in a very dilapidated condition, and the scheme proposed by the architect, Mr. F. C. Penrose, "will considerably augment the accommodation of the church," an argument which seems to cut both ways, for the enlargement will hardly meet with sympathy from admirers of "George Eliot's" works, as it will necessarily destroy the church as the novelist knew it in her early days. The plea for subscriptions reads badly when we recollect "George Eliot's" denunciations of an imaginary restoration in the earlier chapters of that work. Mr. G. W. Jackson, of Walthamstow, denies, however, that Chilvers Coton represents the original of "Shepperton Church." This can, he says, be found in Astley Church, situated about four miles west of Nuneaton, and about one mile from Arbury Hall, the seat of the late Mr. Newdegate (who, by the bye, figures in the book as Mr. Oldinport). The authoress of "Scenes of Clerical Life" describes that church pretty accurately, mentioning, *inter alia*, the quaint pictures of the Apostles, with long ribbons in their hands. These may be still seen on the walls of Astley Church. Moreover, he adds, the engraving in the frontispiece of the popular edition is an exact representation of Astley Church and its surroundings. This last argument, however, counts for little, as it is possible the publisher, or the artist he employed, utilised a block or photograph of Astley Church already to hand. This much is certain, that Marianne Evans was born in the village of Chilvers Coton; she appears to have utilised and fused together her memories of the parish church and that at Astley for her graphic sketches in the life "Scenes," and many will regret if the spell is broken by the modernising of a church associated with her early life.

The eleventh Congress of the Sanitary Institute will be held at Worcester from the 24th to the 28th September. The meeting will take place at the Guildhall, and a health exhibition will be held in the Skating Rink at the Aboretum, and will remain open till October 19th. The Congress will be divided into three sections, viz.:—Section 1, Sanitary Science and Preventive Medicine. Section 2, Engineering and Architecture. Section 3, Chemistry, Meteorology, and Geology. A reception will take place on Tuesday, the 24th, to be followed by an evening meeting at which an address will be given by Mr. G. W. Hastings, M.P. On the following day the section of Sanitary Science and Preventive Medicine will be inagurated by an address from Dr. Geo. Wilson, F.R.S.E., to be followed by papers and discussions. On the Thursday, Mr. Henry J. Marten, M.Inst.C.E., will open the section of Engineering and Architecture, and the papers and discussions will be given for this and the following day. A conference of medical officers of health will also be held on the Thursday, and in the evening Sir Douglas Galton will deliver a lecture. On Friday the third section will be opened by Dr. T. W. Tripe, while on Saturday evening addresses to the working classes will be delivered by Professor W. H. Corfield, and Messrs. Henry Law and J. F. J. Sykes.

At an examination held by the Sanitary Institute for local surveyors, July 25th and 26th,

nine candidates presented themselves. Questions were set to be answered in writing on the 25th, and the candidates were examined *vivâ voce* on the 26th. The following candidates were certified to be competent, as regards their sanitary knowledge, to discharge the duties of local surveyors:—William Gibson, Bonhay-road, Exeter; Joseph Bennett Massey, 64, Burn-street, Burnley; Joseph Radcliffe, Cambridge-place, Todmorden; David John Reid, 2, Post Office-buildings, Inverness; Samuel Towlson, 54, Hanover-road, Plumstead.

Three terracotta reliefs have recently been acquired from Siena for the Collection of Italian Sculpture in the South Kensington Museum, and are exhibited in the North Court. They are attributed to the Florentine sculptor, Benedetto da Maiano (1442—1498), and were apparently studies for three of the five marble reliefs on the pulpit executed by command of Pietro Mellini in the latter half of the 15th century, for the church of Santa Croce, at Florence, a cast of which is also in the Architectural Court of the Museum. The subjects of these three reliefs are scenes in the life of St. Francis and his followers, and represent the institution of the Order of St. Francis by Pope Honorius III., the death of the Saint, and the Martyrdom of some of his followers in Mauritania. Comparison with the cast shows that the sculptor altered his finished work in several details from his terracotta studies. All three reliefs bear traces of gilding and colouring.

MEETING FOR THE ENSUING WEEK.

Tuesday.—Glasgow Architectural Association. "Mohammedan Architecture in India," by G. Mackenzie.

CHIPS.

The members of the Hampshire Field Club held a meeting in the Isle of Wight on Wednesday week. Appuldurcombe park and house were visited under the guidance of Mr. G. W. Colenutt, and the anchorite's cell and ruined lighthouse on St. Catherine's Downs, and Godshill Church, a fairly good example of Decorated Gothic, containing some Early Renaissance monuments, were afterwards visited.

Mr. William Dawson, of the Crewe Works, has been appointed chief engineer of the Chester and Holyhead section of the London and North Western Railway.

The borough surveyor of Walsall, Mr. A. Hardwicke, has tendered his resignation to the town council, a long period of infirm health having rendered him unable to discharge the duties of his office to his own satisfaction. He will, however, continue to act until his successor is appointed. Mr. Hardwicke succeeded the late Mr. Boys, who died suddenly in December, 1882, and was previously at Stoke-upon-Trent. The salary attached to the office is £250, with house.

The new buildings at the Convent of Nazareth, Ealing Park, were consecrated last week. They have been erected from plans by Mr. F. W. St. Aubyn, of the firm of St. Aubyn and Wadling, of the Temple, W.C.

The premises of the Surveyors' Institution at 12, Great George-street, Westminster, S.W., are about to be completely repainted and decorated, and in consequence of a representation from the contractor that simultaneous possession of the whole of the rooms will greatly facilitate the progress of the works, the council have determined to close the Institution from August 1st to 31st inclusive.

On Wednesday week the Bishop of Birmingham (Dr. Ilsley) opened a new Roman Catholic school which has just been erected at Longton, Staffs. At present only the girls' school has been built, but it is intended to erect two other departments at a cost of about £3,000, exclusive of the expenditure on the land. The present building will accommodate 250 girls, and has cost £1,400. The second department will accommodate 250 boys, and the third department 200 infants. The girls' school is built of red facing bricks, supplied from the Blurton Tilery, and white Hollington stone dressings. There is a tower over the main entrance, and in its front is a canopy containing a figure of St. Gregory executed in white stone. The architect was Mr. W. H. Cox, of Birmingham, and the contractors were Messrs. H. and R. Inskip, of Longton.

On Saturday the members of the London Architectural Association visited Maidstone, and, under the guidance of Mr. Hubert Bensted, architect, of that town, inspected the various objects of interest, including the Museum, All Saints' Church, and the Palace. The party afterwards went to Leeds Castle.

Trade News.

WAGES MOVEMENTS.

Bradford, Yorks.—The masons' labourers and bricklayers' labourers employed in Bradford, who number about 600 men, struck work last week for an increase in wages of a halfpenny per hour—viz., from 5d. to 5½d. About 200 of the men have obtained the advanced terms asked for; of the others, some have left the town, and others are still holding out.

Greenock.—On Friday evening the operative plumbers of Greenock had a meeting, at which it was unanimously decided that the men should come out for an advance of one halfpenny per hour of wages. The present rate is 7d. per hour.

Leeds.—A meeting of the builders' labourers, who have been out on strike for the last three weeks, with a view to get an increase of wages, was held on Tuesday evening on the "Midden," Millgarth-street. A resolution was passed in which the men expressed their willingness to return to work at the rate of 5½d. per hour, but declining to accept the masters' offer of 5¼d. A deputation then waited upon the masters, who were assembled at the Nag's Head Hotel, Upperhead-row, and, after a short discussion, the masters agreed to grant the 5½d. In future six months' notice of any alteration to be made in the rate of wages will be given on either side. The men returned to work on Wednesday morning.

Wolverhampton.—A meeting of the operatives engaged in the various branches of the building trades has been held in the Exchange Assembly Room, Mr. F. Mee, presiding, to revise the working rules of the trade. It was explained that 13 years had elapsed since the rules were revised, and it was deemed desirable to alter them in accordance with modern usages. A committee had prepared a revised list, which was submitted to the meeting, and which was discussed and adopted in the following form:—Wages, 7½d. per hour for operatives; overtime; pay time (time and a-half to be claimed for waiting for wages); walking distance allowed to jobs out of town; notice (2½ hours to expire at the end of any hour); and appointment of standing committee to prevent and settle disputes or refer them to arbitration. A new rule was added that piecework be not allowed in the trade.

The parish church of Lapford, Devon, which was restored in 1882, has just been enriched by a stained-glass eastern window. The subject is the Ascension, and the work has been carried out under the direction of Mr. R. M. Driffield.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

Bitterne, Hants.—For the erection of a brewery, offices, stabling, &c., for Mr. W. H. Complin. Mr. E. C. Poole (Messrs. Poole and Son), Southampton, architect:—

Simonds, Reading	£3,537 11 3
Cawte	3,430 0 0
Franklin	3,425 0 0
Kingerlee, Oxford	3,367 0 0
Light, Portsmouth	3,359 0 0
Stallard, Havant	3,285 0 0
Stevens and Co.	3,154 0 0
Morgan, Isted, and Morgan	3,140 0 0
Crook and Sons	3,093 0 0
Beer	2,929 0 0
Witt, Bitterne (accepted)	2,865 0 0

Rest of Southampton.

Bromley-by-Bow.—For the erection of a three-storied factory in Three Mills-lane, Bromley-by-Bow, E., for Messrs. Kemball, Bishop, and Co. Mr. J. Hudson, 80, Leman-street, E., architect:—

Bentley, Waltham	£2,365 0 0
Little, Whitechapel	2,348 0 0
Gladding, Mile End	2,293 0 0
Holland, Poplar	2,248 0 0
Norton, Stratford	2,097 0 0
Eaton and Co., Whitechapel*	2,045 0 0

* Accepted.

Cardiff.—For the erection of two villas on the Tyn-y-pwll Estate, for Mr. T. Evans. Mr. C. C. Jones, M.S.A., 44, Charles-street, Cardiff, architect:—

Joinery, &c.:—Williams, E.
Masonry, &c.:—Jenkins, J.

Cardiff.—For drainage, cesspools, stable-yard, &c., to a residence on the Tyn-y-pwll Estate. Mr. C. C. Jones, M.S.A., Cardiff, architect:—

James Bros., Llandaff.

Crewe.—For converting an old Methodist Free Church in Market-terrace into a Salvation Army citadel:—

Coxhead, Leytonstone (accepted) ... £650 0 0

Enfield.—For Wesleyan chapel and schools. Mr. F. Boreham, architect:—

Goodman, W.	£6,575 0 0
Patman, L. and W. D.	6,398 0 0
Gardiner, W.	5,800 0 0
Holloway, J.	5,158 0 0
Anley, J.	4,970 0 0
Dove Bros. (too late)	4,930 0 0
Chessum, J., and Sons	4,875 0 0
Fairhead, A., and Son	4,798 0 0
Allen, J., and Sons	4,735 0 0

Exmouth.—For building ornamental pavilion, refreshment, cloak rooms, &c., for Mr. H. Perry. Messrs. Kerley and Ellis, Exmouth, architects:—

Tozer	£575 15 0
Bradbeer and Grace	320 0 0
Perry (accepted)	370 0 0
Rogers and Co.	260 0 0
Cooper and Son	250 0 0

All of Exmouth.

Exmouth.—For new shop-fronts in Chapel-street. Messrs. Kerley and Ellis, Exmouth, architects:—

Hayman, Exmouth (accepted).
(Seven tenders received.)

Exmouth.—For building a farmhouse at Woodbury, Salterton, for Mr. J. H. Radford. Messrs. Kerley and Ellis, Exmouth, architects:—

Tozer, Exmouth	£593 0 0
Steer, Clyst	552 15 0
Stokes, Woodbury	535 11 0
Pring, Exmouth	499 0 0
Quicke, Lympstone	450 0 0
Long, Exmouth	450 0 0
Hayman, Exmouth (accepted)	388 8 0

Exmouth.—For carrying out certain alterations, building new shops, &c., Rolle-street, Exmouth, for Mr. J. Tozer, grocer. Messrs. Kerley and Ellis, Exmouth, architects:—

Burridge	£295 0 0
Stokes	253 0 0
Quicke, Lympstone	246 0 0
Hayman	226 0 0
Tozer	209 15 0
Long	200 0 0
Cooper and Son (accepted)	198 0 0

Rest of Exmouth.

Gravesend.—For the erection of a temporary chimney shaft, setting boiler, and foundations and walls of new tower up to ground line, at the Wellington Brewery, for the trustees of the late Mr. A. Walker. Mr. A. Kinder, Suffolk House, Laurence Pountney-hill, London, E.C., architect. Quantities by Mr. A. H. Kinder, 34, Clement's-lane, London, E.C.:—

Wall Bros., Kentish Town	£469 0 0
Multon and Wallis, Gravesend	417 0 0
Wallis, W. & E., Gravesend	411 18 0
Gates, G., Rochester	389 0 0
Hill, J., Gravesend	338 19 8
Stiff, H., Dover	325 0 0
Archer, W. H., Gravesend*	316 0 0

*Accepted.

Hammersmith.—For the erection of additional story on stables, for the London General Omnibus Company, Ltd., at Windsor Castle-yard, Hammersmith, under the superintendence of Mr. G. F. Lanham. Quantities by Mr. A. J. Bolton:—

Harris and Wardrop	£1,970 0 0
Haynes	1,968 0 0
Garrud	1,927 0 0
Evans	1,695 0 0
Knight	1,683 0 0
Parker, G.	1,655 0 0
Britton	1,630 0 0
Evans, R. and E.	1,598 0 0
Hunt	1,545 0 0
Toms	1,524 0 0
Stephenson	1,455 0 0

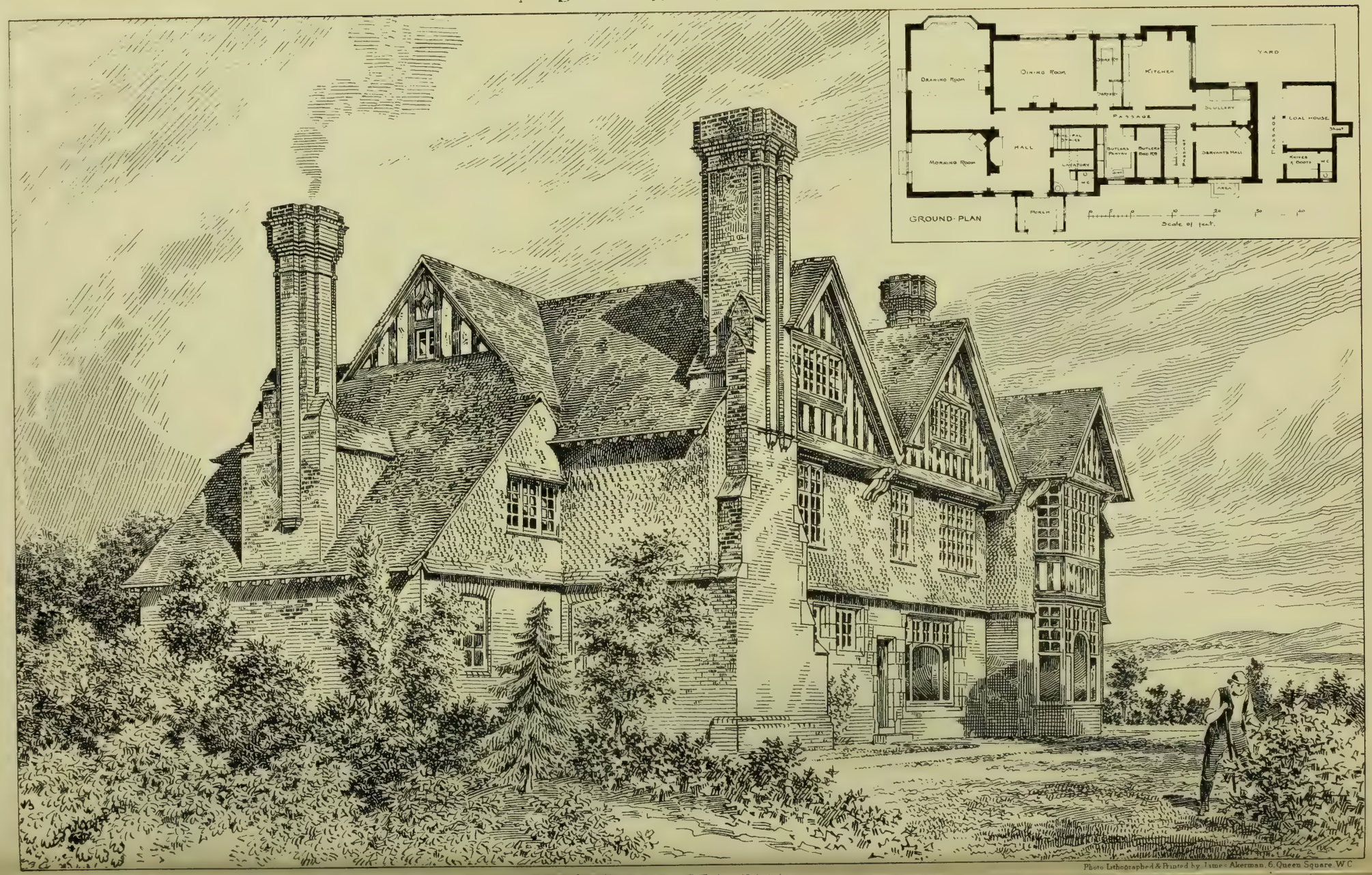


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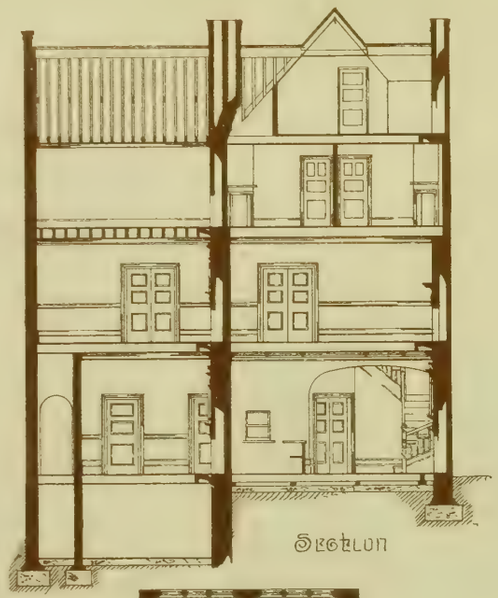
B.I.B.G

Design for

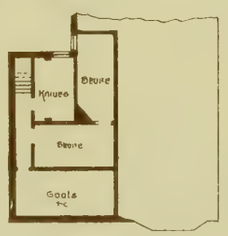
A Cocoa House and

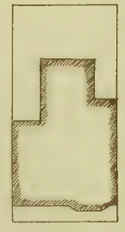
Vegetarian Restaurant

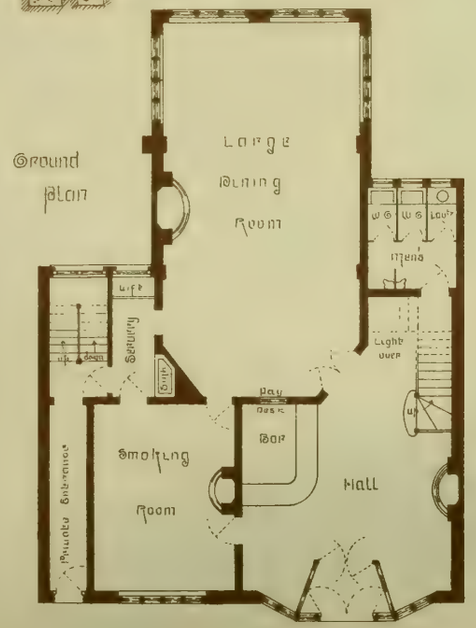
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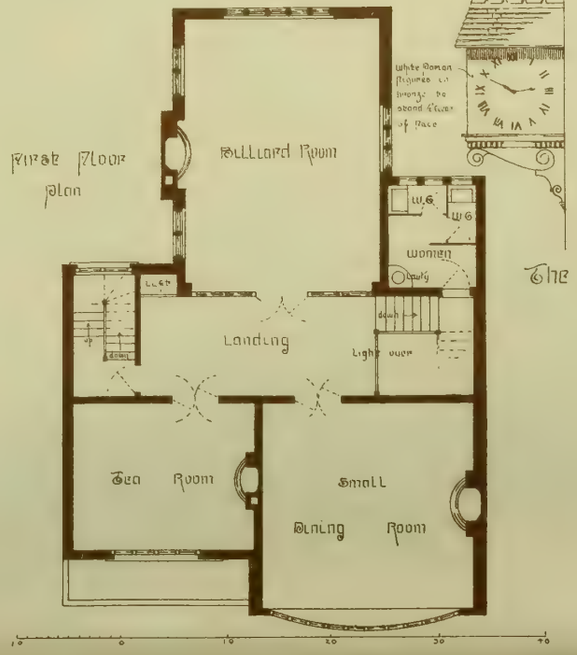












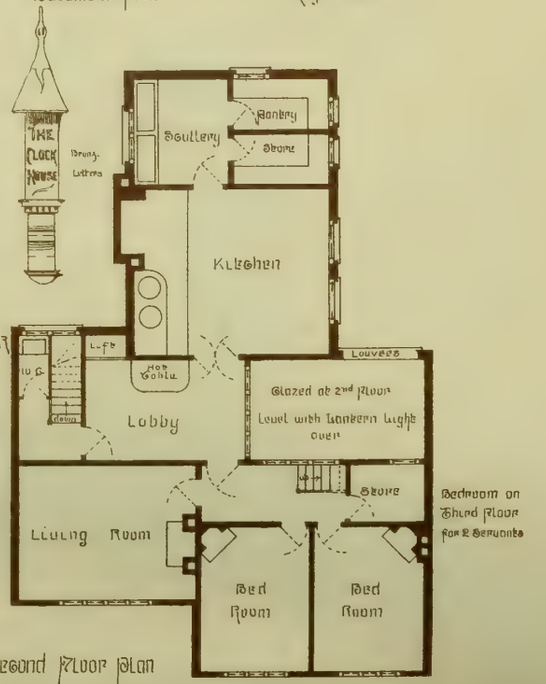
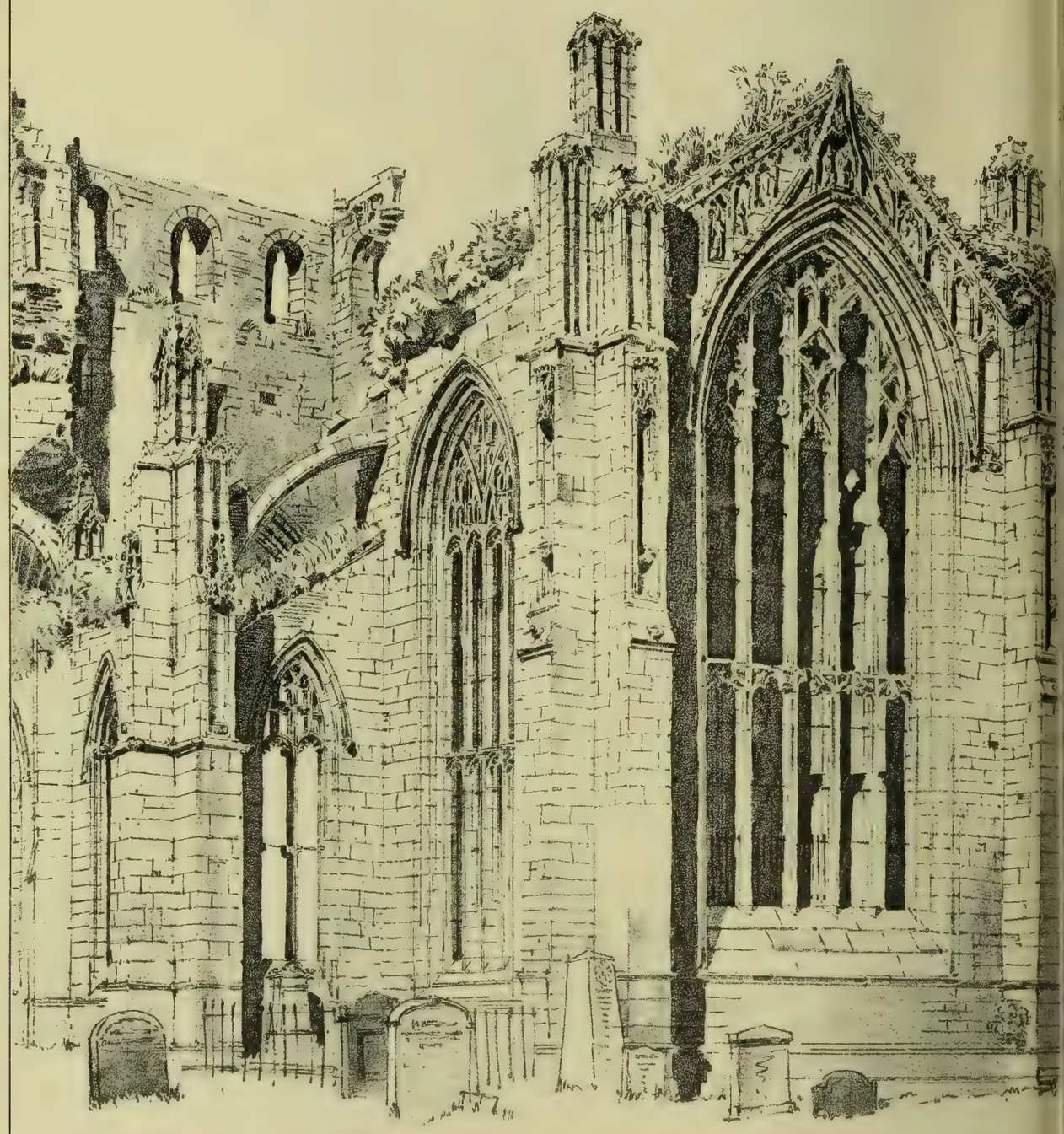
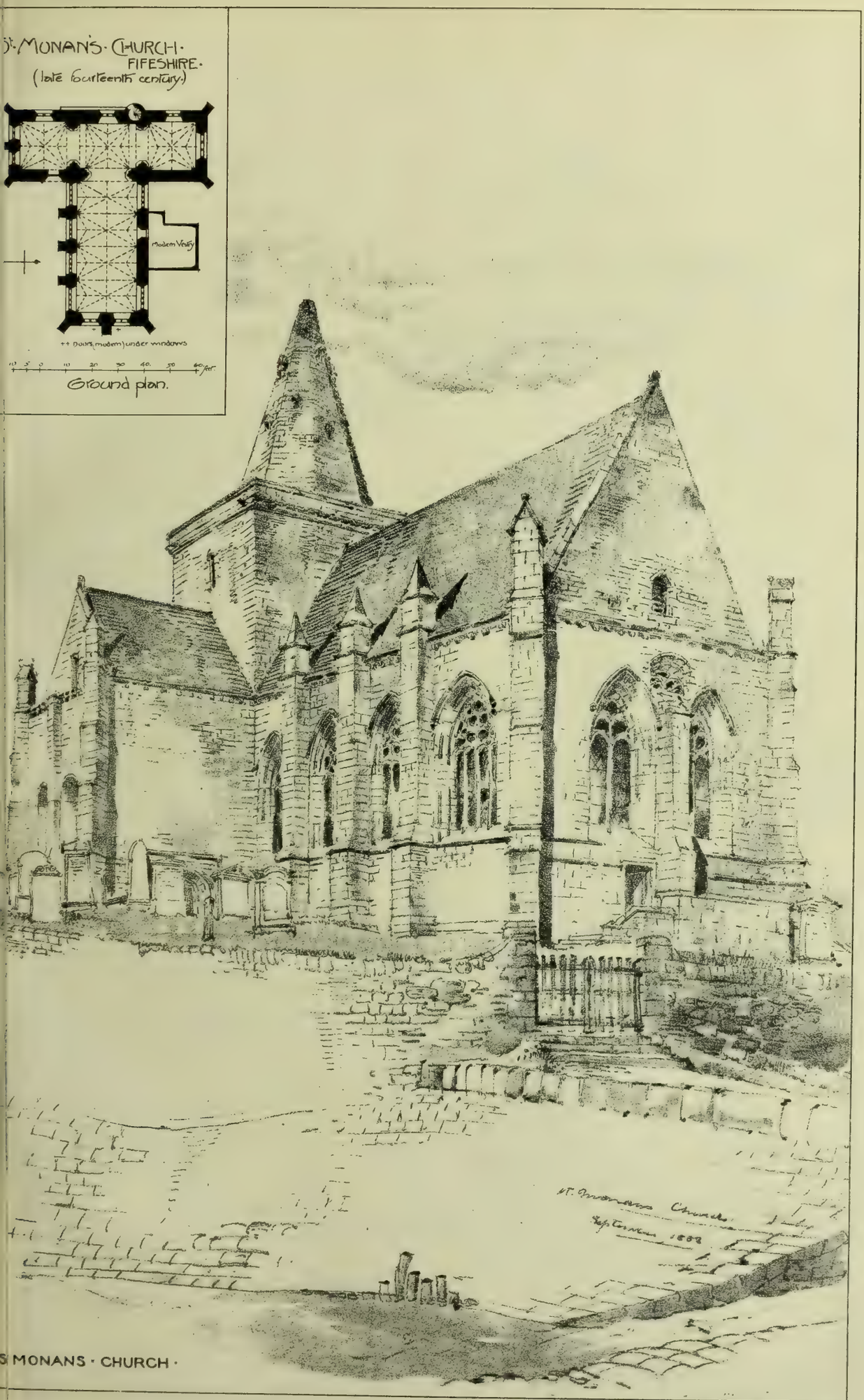


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MELROSE ABBEY · EAST END ·



John Begg
July 1860.



"PHOTO-TINT," by James Akerman 8 Queen Square, London W.

ST. MONANS · BY · JOHN · BEGG ·

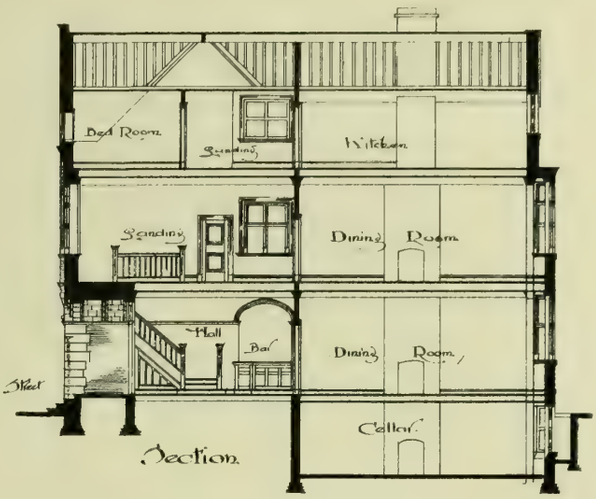


"PHOTO-TINT," by James Akerman 9 Queen Square London W.

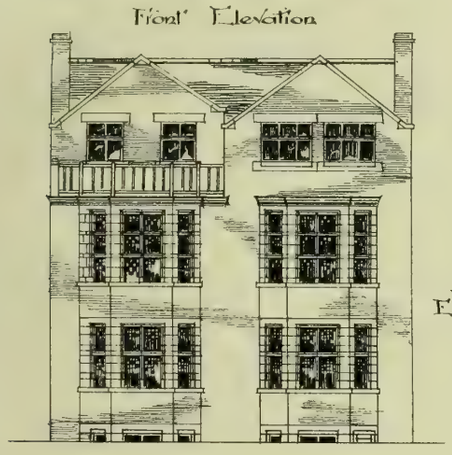
Nº 7 & 9 WIGMORE-STREET-W - ALEXANDER PAYNE & E.M ELGOOD - JOINT ARCHITECTS



Front Elevation



Section



Back Elevation

:B:N:D:C:

A Restaurant for a Market Town

by "Judge Pitman"





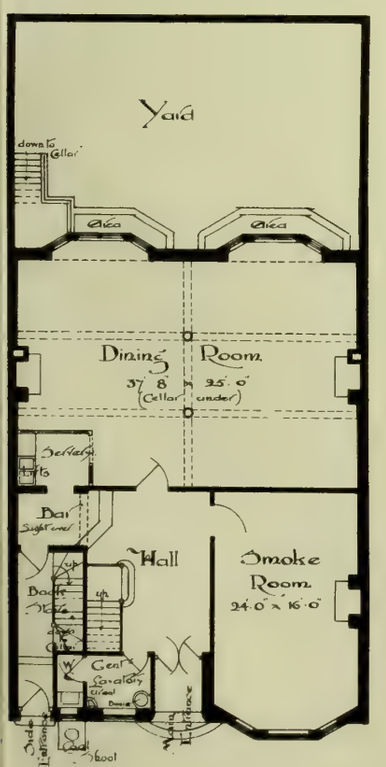
Scale of Feet

"BUILDING NEWS" DESIGNING CLUB

A Restaurant for a Market Town

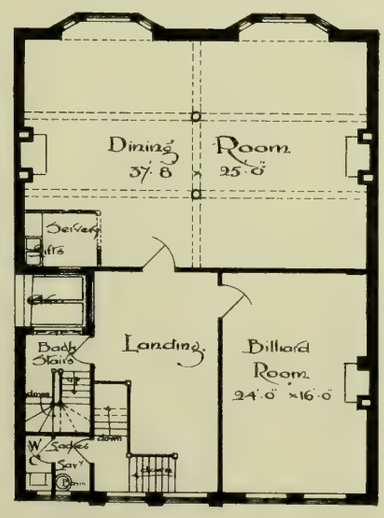
by "Judge Pitman"

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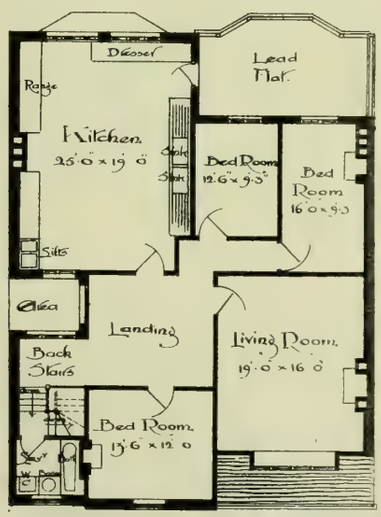


Ground Plan

Note Cellar Larder & Knife cleaning place are under Dining Room. Coal Cellar under Side Entrance.



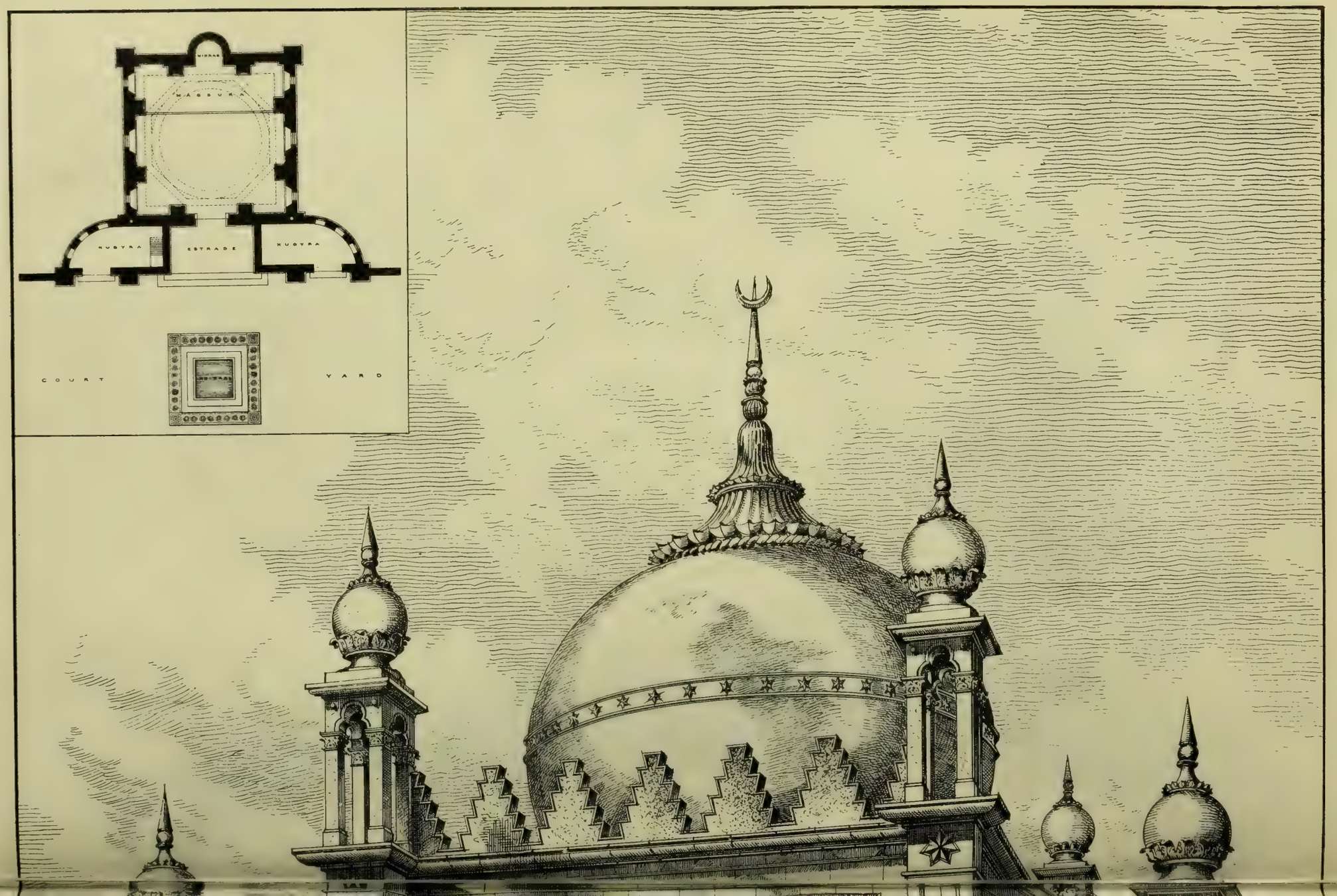
First Floor Plan

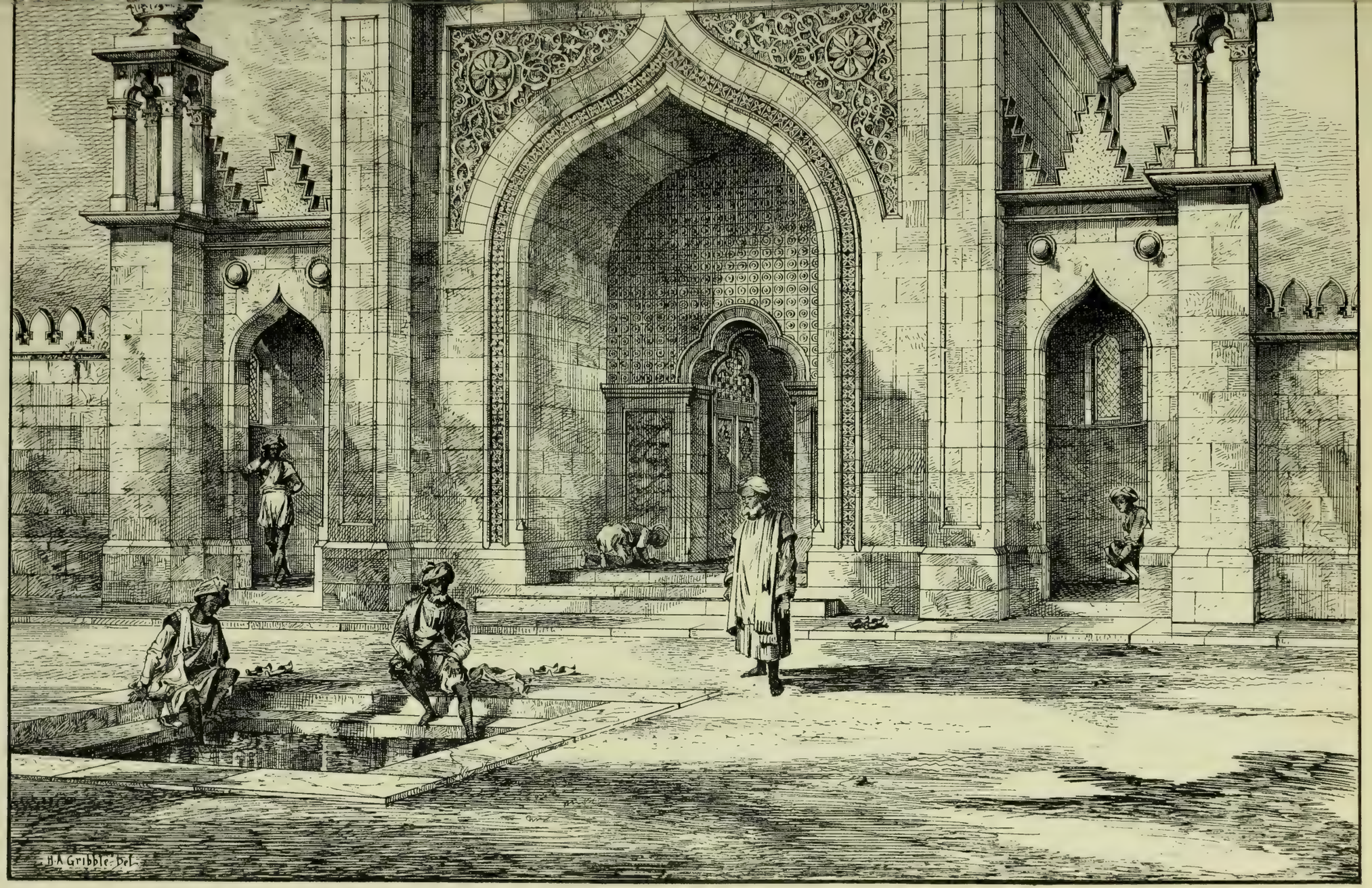


Second Floor Plan

Scale of Feet

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NIBRAS
MAGSURA
KUBYRA
ESTRADE
KUBYRA
COURT
YARD



THE MOSQUE · WOKING · W·I·CHAMBERS·ARCHT

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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1805.
FRIDAY, AUGUST 9, 1889.

TECHNICAL OR APPLIED DESIGN.

THE practical value of the instruction given by the Government schools of design is not so apparent in some of the technical branches of art that are prescribed for as in those in which the imitation of nature or the copy from the antique form the principal motives. We have frequently observed that more attention has been bestowed on subjects which give the greater pleasure to the student, and in which chiefly his imitative powers are mainly concerned. Masters in the arts of drawing and painting are aware of the greater eagerness with which their pupils engage themselves in subjects like landscape, portraiture, and in attempts to paint than they do in the study of the drier and more abstract principles of art. The imitative faculty is the earlier, as we find in the exhibition of every industrial school, the yearly drawings submitted from the London Board Schools, and like exhibitions, where we see models of cathedrals made in shells or corks, or copies of pictures from illustrated journals. The Department of Science and Art should properly exercise a check on this tendency of national art education, and its chief function should be to direct the art instruction in the schools throughout the country. The present exhibition of drawings at South Kensington, which we reviewed last week, is instructive as affording examples of the objectionable tendencies of the system which allows the student to select his own subjects. The meeting we reported last week, held by the Society of Art Masters at South Kensington Museum, is a timely expression of opinion. Mr. Edward R. Taylor, the head master of the Birmingham Municipal School of Art, very justly said the present system of administration is costly, and by the changes made in the machinery of the Department it has become complicated, and is productive of much friction. The central department was studied before the progress of the students. We may refer to the stage 23 of applied design, in which designs for buildings and decoration are made, without doubt, the most important of the functions carried on by the department, and for which it was primarily established. In the stage 23 *b*, architectural design, we find a great deal of patient workmanship, finely-executed drawing, and knowledge of ornamental detail, but little evidence of instruction in the foundation or primary qualities of architectural design—we mean constructive knowledge. There is clear evidence in these painstaking and admirable specimens of draughtsmanship that copies of old buildings are taken, and the designs sent in for cathedral churches, country residences, and municipal buildings are more or less copies of buildings that have been illustrated, and which have furnished all the data. The idea conveyed by the words "applied design" has been completely absent from the minds of masters and student. Why, for instance, is the old Mediæval type of a church always taken, unless it is that it affords the pupil the readiest model to follow in the external design? The beauty and harmony of the Mediæval Gothic church may be considered an excellent model in its structural design —as perfect in its way as the human figure from the antique—the expression of ideal design; but it is nevertheless not the right way to teach "applied design." The student in this stage should first, at least, be required to exercise his faculty of design upon plain buildings, and to give reasons for his employment of any feature or system of ornamentation. In other words, the factors of construction and material ought to be before his mind before he attempts to make an elevation and a finished perspective. It is needless to inquire whether this course of study or instruction is that followed by the Departmental schools. The designs are themselves the best witnesses of the instruction given and the payment by results system. Design is studied historically by examples, and no other system appears to be taught, as far as we can see. To take the next sub-division of this stage, *c*, "Ornamental Design as applied to Decorative or Industrial Art," how many of the designs for wall-papers, carpets, hangings, and decoration are honestly the result of the principles inculcated by the Art Department? The examiners in this branch include Mr. W. Morris, Mr. Walter Crane, Mr. Alan S. Cole, whose authority we will not dispute. In their award of the silver medal to a student of Macclesfield School for a carpet design, they admit that the design is, "however, not fit for a Brussels carpet, though possible of execution as a hand-made carpet." We should think not. Imagine the filling composed of lions, leopards, and other animals, natural forms that cannot truthfully lend themselves to the design, or, rather, mechanical manufacture of a textile like a Brussels carpet. What principles could ever have been learned by this fortunate recipient of a silver medal?

The want of sense of adaptation to material is a common fault in many of the designs for printed hangings, carpets, and lace curtains. Well arranged and logical design is certainly the exception; to see groups of sheep on a cotton fabric in perspective, and landscapes introduced in cotton hangings, is more than we should have expected after nearly half-a-century's existence of State schools of art. As regards lace, the examiners say, "The designs for hand-made laces, as a whole, are taken from the worst period of art. Perhaps a reference to earlier types of pattern, such as those of the late 16th-century, might be of use to the lace designers. There is no reason why a pattern for lace should not show good organic construction and variety of ornamental types, as do those for textile fabrics." Good advice as far as it goes, and certainly called for; but the students themselves would appear to be unaware of the principles upon which they should work in these textiles, nor is the difference between hand-made and machine-made productions of this class sufficiently considered. We can point to several designs in which organic construction has been completely sacrificed to the notion of introducing animals and other incidents of landscape treatment. We must suffice to notice a printed cotton hanging, to which a silver medal is awarded, in which the designer has endeavoured to crowd into the repeat of the pattern the repertoire of floral beauty found in the poet's verse, wild thyme, oxlips, violets, woodbine, roses, and eglantine, amidst a profusion of foliage and birds, the effect of which is distracting to the eye, and, however ingenious the scheme may be, the treatment is certainly too naturalistic and the colours are too strong. We might make similar criticisms about the other divisions of this stage, but these will suffice to show that the instruction in these stages in the provinces is either faulty or inadequate. One remark of the examiners applying to architectural drawing is that, referring to the drawings of St. Columb's Cathedral, "There are no sections of the spire, nor of the turret roof and parapet"—a comment which supports what we have already said, and in reference to decorative work in which figures are introduced they say, very properly, "students who are not figure draughtsmen should not be encouraged to select subjects whose principal interest lies in figure sculpture or in figure painting"; a word of advice that may be judiciously taken by many masters and students. We are confident that if the advice given by the chairman of the Society of Art Masters in his motion were carried out, there would be less to complain of—viz., that the interests of the students demand that the results of the examinations as determined by the examiners, independently of the grant, should be communicated to the masters and students. The system of payment by results, as Mr. Fisher says, has contributed much to enfeeble the Department by limiting the teaching to subjects which can be tested, and by causing the standard to vary with the state of the national exchequer, while the aims of art education are neglected.

RICHMOND MUNICIPAL BUILDINGS COMPETITION.

THE picturesque little town of Richmond in Surrey is about to have its own municipal buildings. Eight sets of designs have been submitted to the vestry for the new building to be erected on the site of the late Castle Hotel, in Hill-street, presented to the town by Sir J. Whittaker Ellis, Bart., M.P., for the purpose. The designs have been on view at Mr. Piggott's premises in George-street. Mr. James Edmeston, the assessor to whom the drawings were referred, has made a report, which we published last week, recommending two designs, and these have been accepted by the vestry. The plan of the site, which occupies an oblong area between three boundaries formed by two streets and a garden, and one closed by buildings, made it necessary to place the main offices and council chamber along the three open frontages, and to provide for ancient lights in the rear. Three or four of the designs have carried out these conditions successfully, the others have sacrificed the essentials of light, the corridors are imperfectly illumined, and in one or two cases borrowed lights are shown. One of the main questions with the competitors was the position of council chamber; but there was only one admissible position for it—that at the end of site facing the gardens. All the plans show this position, some placing the chamber transversely, its side facing the gardens, others making its length coincide with the axis of the site.

It is, perhaps, difficult to say whether "Q. E. D." or "Westward Ho," which have been recommended as first and second, stands the highest in merit. The second design is in some respects superior. The ground-plan is more architecturally disposed, the halls at end of short corridor are good features, and the latter is well lighted by the area. The main entrances are placed both in front; but the council-chamber at the corner of the Broadway and garden fronts, on the first floor, is less happy. The elevation of the latter design has more architectural merit, the façades towards Hill-street and New Broadway are well balanced and coherent in their lines, and the council-chamber is made to emphasise the end of the block. These are merits which the assessor no doubt considered, and which, had it not been for the greater cost of this design, would have induced him to place it first. The design "Q. E. D." is less expensive in style, more broken in its lines and features, and has also a good plan to recommend it. We will now consider these designs in more detail.

The design with motto "Q. E. D." (Messrs. Elkington and Sons, Cannon-street), placed first by Mr. Edmeston, has been adopted by the committee, and from a careful examination of the plan our opinion is that they have made a good choice, though a few improvements may suggest themselves. The public offices and council-chamber are well placed

on the site, and what is important in our view, the council-chamber is placed on the ground floor, avoiding a stair approach. There are two main entrances: one from the centre of Hill-street, giving direct access to the corridor, and another from New Broadway, next the council-chamber, which connects at right angles to the main corridor at the council-chamber doorway, thus avoiding a crush at this important junction, besides enabling the public offices to be approached by a separate entrance. The public offices—those mainly and daily in request by townspeople—are chiefly at the Hill-street end; the rate-collectors' office on the left hand of the entrance, with public waiting-room in front, and the vestry clerk's office on the right-hand side of entrance. The vestry clerk has a private room further in with a muniment-room between his two offices. Within the vestibule on the left-hand side is the main staircase hall lighted by a lantern over and in convenient proximity to the clerk's offices. A public waiting-room adjoins it, lighted from the area, and opposite to it, facing the Broadway, are the medical officer's and inspector of nuisances' offices side by side. Then, following on in front, are a large committee-room and chairman's office, and on the rear side of corridor the members' cloak-room and lavatories, &c., lighted and ventilated from the area. Then comes the council-chamber, 80ft. by 31ft., extending across the whole garden end of the building site, and cut off from the offices by the entrance from Broadway and private corridor. Its side wall stops the main corridor, the latter leading directly to the chief doorway which faces it. The approaches and lighting of corridor are well considered. The council-chamber has a bold circular bay or recess fronting the gardens on the axis of corridor, in which is the mayor's table. The groups of benches are arranged in four groups in the middle of chamber, with the clerk's table in centre, the ends of the room being skilfully appropriated at one end as an ante-room, and at the Broadway end as a space for visitors. The council occupy the central square portion and apse of the hall, which has a domical ceiling and lantern over it, and this portion is internally pronounced by piers and the interior walls, and externally by a high roof, while the ante-room and gallery are roofed at a lower level, and appear as wings or aisles to the square hall. The first-floor arrangement places the surveyor's public and private offices at the Hill-street end; the accountant's office is at the corner over the vestry clerk; a large committee-room, 29ft. by 20ft. 9in. comes next along the main front, and includes the depth of corridor, the other part being caretaker's-rooms. On the second floor are the drawing-office and spare rooms at the Hill-street end. The remaining part of area is roofed. Externally the design is treated in a free Renaissance style; an octagonal corner and high roof and turret emphasise the corner at the Hill-street end, and an octagonal roof and lantern is placed over the council-chamber, the remaining portion of elevation being low. The two main blocks of the building are thus pronounced, and the elevations and perspectives, the latter in ink, show a well-broken group of buildings, though somewhat wanting in coherency. The walls are proposed to be of red-brick facings, with buff-coloured terra-cotta on the dressings and features. A neatly-drawn set of tinted elevations are sent. The estimated cost is £10,025, or at about 9d. per foot cube.

"Westward Ho" (Mr. T. Verity, Regent-street), is placed second. It is undoubtedly an able design, has a well-arranged and architectural plan, and a solidly-treated and official-looking exterior, more substantial and monumental than the first; but the cost would be greater, as it is proposed to carry up the basement in rustications, with courses of stone or terracotta and brick above. The author has a well-arranged plan. The main entrance in New Broadway, near the Hill-street end, leads into a large square hall, with staircase in the rear, next to which are conveniently placed the retiring-rooms, latrines, &c., lighted and ventilated by the area at back. A short wide corridor connects this main hall with another at the other end of the block, thus affording ample space and light, and giving access to the offices. The offices for the vestry clerk are on the left-hand side of the entrance hall, facing Hill-street, a private passage connecting the clerk's offices with a waiting-room between. On the right-hand side of entrance in front is the rate-collecting office and accountants' room, next to which are the sanitary inspector's and medical officer's rooms. An end waiting-room, facing the gardens, adjoins the second hall, and is conveniently placed next to the front corner committee-room, which faces both the Broadway and the gardens at the angle. A second entrance is shown from the Broadway close to the inspector's office, and a private entrance to council-chamber is arranged from the garden front. The retiring-rooms and conveniences are well placed at the back, and the author has shown judgment in placing the offices most sought after by ratepayers in the most accessible positions as regards the entrances. The first floor has the council chamber, 38ft. 9in. by 30ft., at the corner of the garden end, well lighted on both sides, with ante-room adjoining, and separate stair approach. The chairman's private room, committee-room, and waiting-room are placed along the main front, and the surveyor's offices over the end facing Hill-street, and above those of the vestry clerk. The second floor is appropriated to a caretaker and spare rooms; heating apparatus and electric-lighting machinery being provided for in the basement. The sections show a handsome principal staircase; a sunlight extractor over the council-chamber, and vitiated-air chambers over corridors, of their whole width, into which the foul air of offices is drawn in connection with an exhaust shaft in the roof. The sepia perspective is in an Italian style with Doric details in main cornice, and is effectively drawn; the council-chamber is pronounced by a slight projection, and is carried up with an attic, each side pierced by three large circular-headed windows. The main entrance is marked by deep consoles supporting a small balcony, and there is a flèche over. Estimate sent is £10,460, at 8d. per foot cube.

The design "Bon Espoir" is accompanied by a sepia perspective showing a building of Italian Renaissance character, with ornamental gables and corner octagonal turret corbelled out at the Hill-street end of façade. The ink elevations and details are handled with some ability, if we except the rather awkward corner at the council-chamber end. The recessed entrance within arches and the hall treatment are good features of the design. The ground-plan is rather broken up. A principal entrance and hall in centre are connected by corridor on the right side, with vestry clerks' offices and large committee-room at the garden end with a terrace and steps, on the left-hand with medical officer's and inspector's, rate-collector and gas-tester's offices on the Hill-street front. The council-chamber is, like the last, placed on the first floor fronting the garden, and is 40ft. by 30ft., with an ante-room and corner visitors' stairs in turret. Along the front are placed the chairman's and committee-rooms, spare office, accountants' and surveyors' offices, the latter overlooking Hill-street. The estimated cost is £11,895.

"Stet," Flemish in the details, is picturesquely shown by sepia perspectives. The garden end bay of council-chamber with its high-hipped roof is made a piquant feature, and there is a turret at the Hill-street corner. The ground-plan has a long corridor, with the principal entrance in Hill-street, and circular bays or lobbies for light in areas are provided, which break up the plan. A staircase to council-chamber is at the end of this corridor—a rather awkward arrangement—and a side entrance from Broadway to the same room is shown. The vestry clerk's offices are located in the centre of the Broadway front, the rate-collector and inspector on each side of main entrance; committee and waiting-rooms at the other end under council chamber. The recessed arcaded centre in Broadway breaks the long front. On the first floor is the council-chamber, 38ft. 6in. by 35ft., with bay window towards garden; the benches are placed on each side of the chamber, and the mayor's chair in the bayed recess, which is 21ft. wide. The committee and waiting-rooms are in front. The medical office is behind—certainly inaccessible; the accountant and surveyor at the Hill-street end of block. The broken-up elevation, with its low centre office (vestry-clerk's apartment) and the gables of ornamental brickwork, divided into panels, is picturesque, and the details are of Gothic character, and cleverly drawn. The cost is estimated at £9,774.

"Concilium" is also Renaissance in style, and is illustrated by large, bright brown perspectives drawn with spirit; the materials are brick and terracotta, with details of Elizabethan character. The elevations are less satisfactory and somewhat weak. Two entrances are shown in the Broadway façade. The right-hand corridor is not well lighted; the vestry-clerk is located at the Hill-street end, and the rate-collector on the right-hand side of main entrance. On the first floor the council chamber, 40ft. by 30ft., is placed at the garden end of block, its axis lengthwise with it, the surveyor and accountant being at the other end. We do not like the corbelled-out corner passage to ante-room of chamber. A gallery is shown at the side, and a square-ended bay approached by visitors' stairs. The author estimates the design at £10,550.

"Rules" is a bold Italian design with a lofty square tower and pyramidal roof at the inner corner of Hill-street. The front is gabled at the ends, and a centre portico and high roofs are shown. The garden council-chamber front is regular. Besides the central portico, another entrance is made at side of tower in Hill-street, leading to an ill-lighted corridor, with borrowed lights through the offices, objectionable on many accounts. The back area only lights lavatory and latrines. The large staircase is top-lighted. The town-clerk and committee-rooms are awkwardly arranged at the wrong end of the building. The council-chamber on first floor is 47ft. by 23ft. at the garden end, placed transversely. The cloak-room and lavatory are too large, and the chairman's room unsatisfactory, while a part of passage is badly lighted. Cost, £10,500.

"Nota Bene," shown by a bold ink perspective in a plain English Domestic style has a staircase, hall, and corridor intersecting with entrances from Broadway and Hill-street. The council-chamber, 48ft. by 26ft., is placed at the garden end, with a flèche over roof. The plan is wanting in study, and the character of the building lacks appropriateness.

"Syenes," Italian in its elevation, is to broken up by bays and pilasters. It has side tower with cupola. The wide hall i poorly lighted by the area, and the sam defect is noticeable in the corridor of firs floor, where borrowed lights are shown One main entrance is in Hill-street, a lon corridor leading thence to the several office the vestry-clerk being placed at the garde end, followed by medical officer's, inspector' accountant's, and rate-collector's offic along the front, with side entrance. Th council-chamber is placed at the usual en

of building on first floor. Altogether the area is not satisfactorily utilised, and the details are meagre. The cost is estimated at £9,835.

HARRINGAY BOARD SCHOOL COMPETITION, HORNSEY.

THE Hornsey School Board, under the advice of Mr. E. R. Robson, the consulting architect to the Education Department, have, out of a selection of three designs submitted in competition for the Harringay Board School, decided upon the design with motto "Nemo" as the best, the author being found to be Mr. Charles Bell, Salters' Hall-court, Cannon-street. The plan is strictly according to the instructions given to the competitors, and conformable to the rules of the Education Department. The site is bounded by Frobisher-road on the north, and Falkland-road on the south, the east and west boundaries adjoining building land, the dimensions being 269ft. 6in. on the Falkland-road side, and 247ft. 11in. on the Frobisher-road frontage, and about 200ft. in depth. The design of "Nemo" places the large hall for 600 in the centre, its end facing the Falkland-road, and therefore in the axis of the block of buildings; it is 71ft. by 35ft. On each side are the staircases and entrances for boys and girls, adjoining cloak-rooms for each department, and the entrances, playgrounds, and offices for each are well separated. Along the north end of large hall and cloak-rooms runs the main corridor, and entrances giving access to three classrooms for 40, 50, and 60 children (girls) at the right-hand side, and a schoolroom for 150 scholars, 73ft. by 22ft., at the other end, divided by sliding glazed partition into two unequal portions of 90 and 60. In front there are two other class-rooms for 40 each, divided by revolving shutters, so that they can be thrown into one if desired. The whole of the ground floor is appropriated as required for the infants' department for 400 scholars, and a cookery kitchen. The first floor is for girls, the same number and order being maintained in the school and classrooms, a gallery over hall being shown. The second floor repeats the arrangement for boys. The plan is compact, placed centrally on site; the main front is towards Frobisher-road, and the building is of three stories. We observe the lighting arrangements are well attended to; the school has its end to the north, the classrooms receive the north and east light mainly. All the classrooms are lighted from the left. Dual desks are shown, the back rows being raised three steps. The entrances for each department are well separated, and, on the whole, the plans exhibit knowledge of the requirements. The elevation is less satisfactory. The London School Board features and windows are used; but the roof-line is somewhat commonplace and heavy. Stock bricks, relieved by red-brick dressings, are proposed, and the estimate is £10,442.

"Efficiency with Economy" (Messrs. Mitchell and Butler) and "Light" (Mr. Chatfield Clarke) divide the second prize. The first of these designs has a good disposition of the departments. Unlike "Nemo's," the classrooms for 70 and 50 in one long wing are on the left-hand side (boys' side), divided by a partition for 70 and 50 scholars. The hall is central, like the last; but a classroom for 60 each is placed on each side of it, instead of entrances and cloak-rooms. The schoolroom for 160 is at the other end, and forms corresponding wing to the classrooms. In front of the corridor is a cookery kitchen, opposite hall; and at the sides are the respective cloak-rooms and entrances. The entrances, playgrounds, offices for each department, and infants are well separated. In this plan the end of large hall faces Frobisher-road, and is thus reversed to that of "Nemo." The hall accommodates 480 scholars seated. The first floor practically repeats the arrangement, and is appropriated to girls, and the second floor is like it for boys. We notice that the classrooms have the groups of dual desks placed for left-hand light, and the schoolrooms and classrooms are well placed for north and east light. In the elevations and perspective there is much to recall Mr. Bell's style, and the detail and features are of the Board School type—the roofs on the hall side rather awkward; but the chief elevation is reserved for the Falkland-road. "Light" places the hall on one side of the site, and is well lighted on three of its sides, accommodating 480 on ground floor and 120 in gallery; the schoolroom, divided for 90 and 60, is on the east side, the classrooms being in front, receiving the north light, and the author points out that only the return ends of schoolroom and hall are open to the south sun.

The strong points of this plan are the northern aspect of the school and classrooms, and the left-handed lighting they get; the position of the playground open to the south, the distinct position of babies' department with regard to rest of infants; but these advantages are secured at the expense of balance of plan. The hall is hardly central enough for the boys' and girls' departments, being placed next the infants' entrance. The other two floors follow. The working kitchen is convenient to the girls' department, and is for 28 scholars. The Board School style has been adopted, and the elevation towards the north is well balanced by the projecting wings of the schoolroom on one side, and the babies' classroom on the other. The roofs are high and hipped. The author warms the rooms and corridors by radiators, and the mezzanine over ground and first floors give extra accommodation to masters' and infants' rooms. A glance round the room in which the rejected designs were placed showed many skilfully-drawn plans and elevations. "Harringay," shown in a sepia set, is well grouped in a sort of Queen Anne. "Spes" is good on plan, and has properly-divided classrooms, and the sepia perspective shows some nice grouping. "Lux" shows some well-arranged classrooms; but the corridor is too long, and the design costly. A clever perspective with two towers is shown. "Scrio" has a too long schoolroom, and the lighting is in the teachers' eyes, though careful in drawing. Another well-drawn set is "Durability and Economy."

ARCHITECTURE AND THE ROYAL SCOTTISH ACADEMY.

THE scheme for remodelling the Charter of the R.S. Academy has been published, and a glance at the leading features suffices to show that the proposed changes are so far improvements on the original. The Academy has till now been hampered by conditions as to the administration of the funds at its disposal, the number of its associates, and other details. The committee of architects appointed in Edinburgh to confer with the Academy Council and take steps to promote the interests of architecture, which had been neglected in the past, waited long for a reply, and, indeed, it was only when the proposed improvements had been decided on by the council, and the draft of the new Charter completed for transmission to the Home Secretary, that the committee were informed that the particulars of the new proposals could not be submitted for criticism or amendment, though assurance was given in general terms that the arts of painting, sculpture, and architecture were placed on a footing of equality. The same might have been affirmed of the original Charter, and the reply was considered so far from being satisfactory, that a proposal by Dr. Anderson to memorialise the Home Secretary to delay the granting of a new Charter till architects had been allowed to make suggestions, appeared to be the only practicable course open in the circumstances. Another member, however, sent a communication to the effect that he had private information to the effect that it was the intention of the council, with the additional powers of the new Charter, to take measures for a better representation of architecture in the Academy, by increasing the number of architect associates, giving better encouragement to exhibit architectural designs, and promote the study of architecture as a fine art by lectures and otherwise.

The practical result of these proceedings has probably been the publication of the revised Charter. In any case, the Academy is a national institution, and could have no enemies to meet, unless it were those who wished to keep it a close corporation, devoted only to the interests of one special branch of Scottish arts. If this result is to be avoided, it can only be by giving a more liberal share of patronage and encouragement to the other two branches of art, and especially to that of architecture, which has been hitherto neglected as a branch of study by the artist painter—with few notable exceptions. Possibly it would not be expedient to make any special arrangements in the interests of each branch of the associated arts. Nothing of this character at least has been drafted in the new proposals; and the force of public opinion, and the efforts of architects interested in the matter must be relied upon to give architecture its proper place in the Academy. The opportunities for attaining this desirable result are certainly improved by the new proposals.

The new Charter provides for the constitution of the Academy the same three classes as before—viz., the highest order of academicians, their number restricted to thirty members; the second order of associates, elected by academicians with no restriction as to members, and honorary academicians. Academicians and associates, under the new Charter, forfeit their right to pension by absence from Scotland for any period exceeding three years, or by ceasing for two years consecutively to send works for exhibition.

The affairs of the Academy are placed under the management of a general council of the members, another of academicians, and a council consisting of the president and secretary and other six academicians appointed every year by the Council of Academicians.

In the allocation of funds at the disposal of the Academy, after payment of all expenses, these are to be applied for the promotion and encouragement of the fine arts, for assisting students in their studies, and improving the schools of the Academy, and, if possible, in providing lectures on painting, sculpture, and architecture. The number of pictures allowed to be sent for the annual exhibition by members of the Academy is to be restricted to five, seven being the present number, and only four can be admitted for outsiders.

It may be hoped that, under this new arrangement, a solitary member will no longer represent the interests of architecture in the councils of the Academy. There should be at least one from each of the great cities—Edinburgh, Glasgow, and Aberdeen—provided for in the Charter, though no good reason can be given why sculptors, architects, and painters should not have equal representation as to numbers.

Better provision must be made for the exhibition of each separate section of art in the rooms, and more encouragement thereby given to induce architects and sculptors throughout the kingdom to send their better class of work for the instruction and entertainment of the public. The selection of architectural works for exhibition must not be left in the hands of the committee of five appointed under the new Charter, unless that

committee includes an architect. These and other matters are all within the power of the Academy to arrange. Cordial co-operation will make the institution more worthy of popular support, and much more likely to advance the interests of the art, specially so called, of painting than ignoring, as has hitherto been the case, the importance and interest of architecture in its aspect as a fine art.

LEVELLING.—XVI.

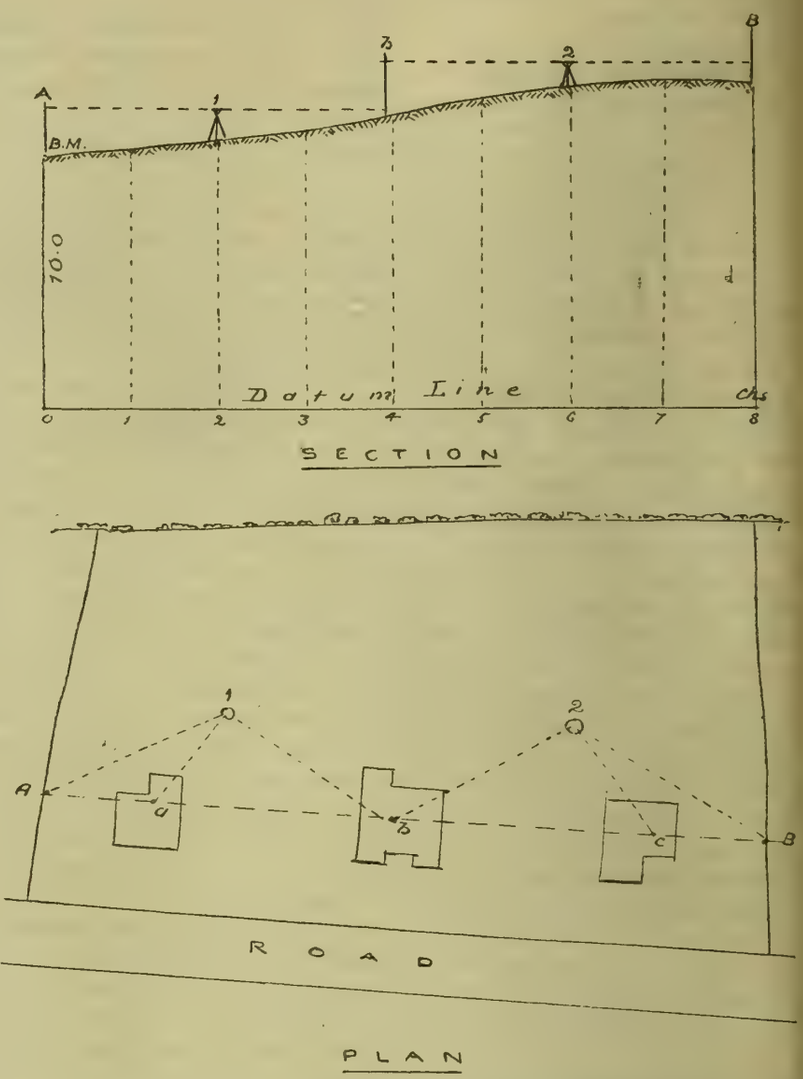
BUILDING PLOTS.

IN our last article we explained how the depth of a trench for drains was to be found from the levels. The original reduced levels of surface of ground (see last diagram) let us take at 12·50, 11·30, 10·50. The trench is supposed to be commenced at 8·20, which is the datum level of its bottom. At the next division it is 7·00, and at the next 6·20. These are supposed to be the levels from datum line to which the trench is to be cut, the mode of fixing which from the surface we have already explained, by dividing the fall proposed by the number of intervals or chains into which the length of gradient is divided. By deducting these new datum levels from the original reduced levels as 8·20 from 12·50, we obtain 4·30, which fixes the depth of the trench below the top of the ground at each point. If the ground surface follows a true gradient, the same depth at each stake or division will give the gradient of trench bottom; but if the surface alters, the new datum levels will also vary, so that a true trench gradient will be obtained. In practice, the beginning datum level for the trench is fixed by the outfall, and at some chains distant it is also arbitrarily fixed, a line drawn between the two giving the gradient of trench. The process explained above is to enable the intermediate depths to be obtained.

We give now another plan of building plot, and a section of the same as a further explanation of how levels can be obtained without recourse to a complicated level book. The land slopes from B to A, and a section is required upon that line for the purpose of obtaining the relative levels of the houses, and the quantity of excavation necessary in the basements. The sites of three houses are shown on the plan *a*, *b*, and *c*, and it is required to obtain their levels for the purpose of a section.

We here adopt the plan of taking the levels already described, when intermediate levels are required, and it is desired not to move the instrument often. Stations 1 and 2 in the plot are selected for the purpose, as being equally distant from the sites. We fix a B.M. at lowest point of ground at A, where the staff is first held. The back reading is, say, 8·30. The staff is then taken to *a*, the centre of site of villa, where it reads 5·20, which is an intermediate level; then it is shifted to *b*, the position of another villa, where it reads 1·20, this being a fore-sight showing a difference of level or a rise of 7·10, and between the two houses of 4·00. The instrument is now taken to the next station 2, and the staff at *b* simply turned round to face it, care being taken to hold it on a firm footing in the same position. The next reading is a back-sight 7·30; the staff is then taken to *c*, intermediate, where it reads 1·50, and then to B, where it reads 3·10, the latter being the fore-sight. Other intermediate observations can be taken from the same positions of the instrument. The difference or rise of level from site *b* to *c* is 5·80. These levels will be sufficient to make the section through A B, first assuming a datum level below the B. M. of, say, 10·00, adding thereto the rises in the way previously shown. Or the sectional line can be divided into chain lengths as indicated by the dotted lines of our section and the reduced levels plotted on them, a more accurate way of obtaining a section of the land; but for practical purposes the six readings we have indicated on the plan are sufficient, all that is necessary in making the section being to measure the horizontal distances along the line A *a*, *a b*, *b c*, and *c* B, so as to set up the vertical ordinates at those points.

Fig 33

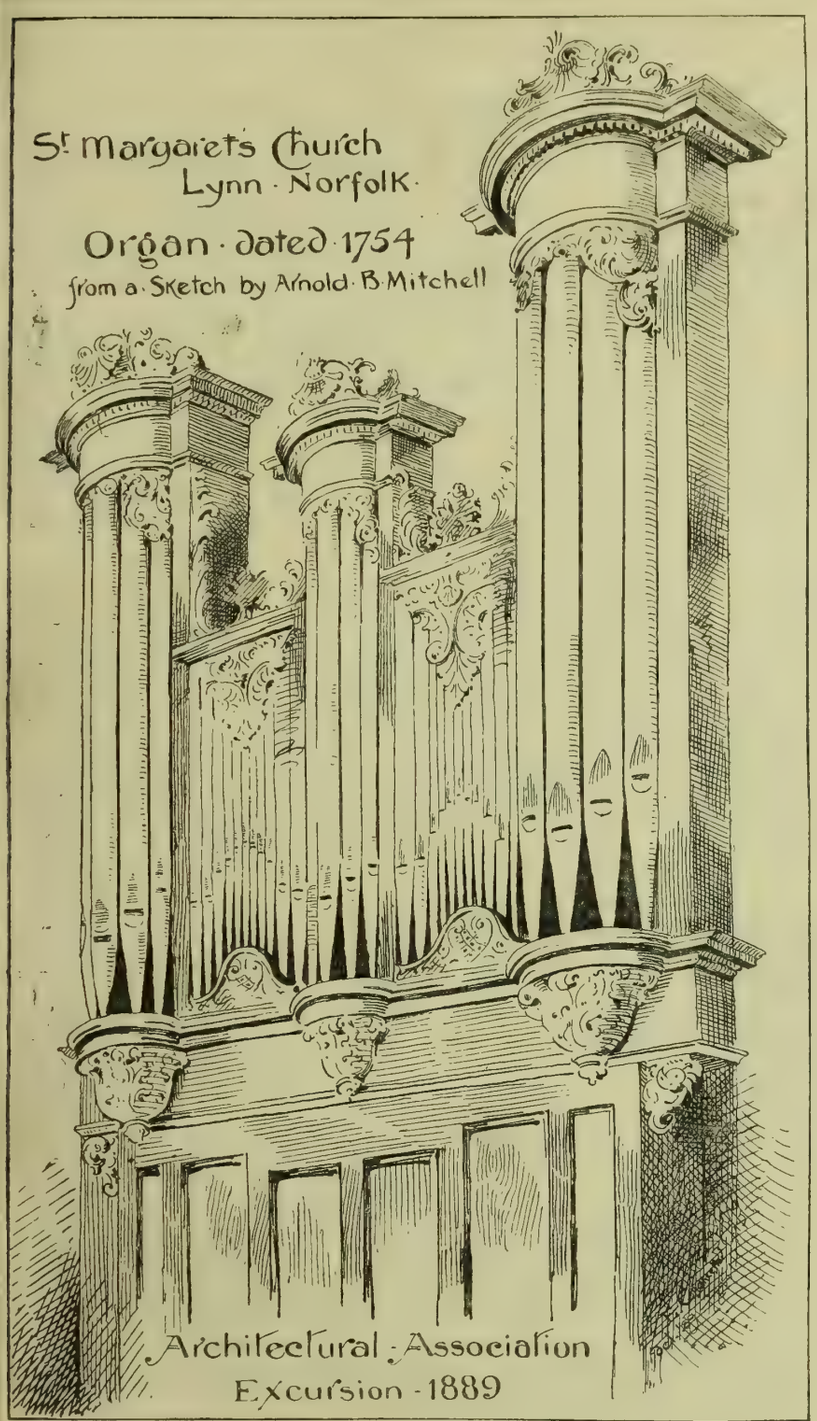


It may be again necessary to point out to the younger reader that each of the two lines of collimation we have shown on the section caused by the change of position of the instrument, may be assumed to be a fixed horizontal plane above the ground, and any number of levels or readings can be taken from it to the surface of ground; the difference in level between the two planes being that between the fore-sight and back-sight read on the same staff at *b*. It is necessary to bear in mind that the staff at *b* is not changed in position, only turned round, and that the two planes or lines of collimation cut it at 6·10ft. apart—in other words, the lines of axis are altered, not the staff; hence the necessity of resting the staff on a firm piece of ground, or, if possible, a stone or peg, driven in level with the ground. If it were possible to obtain the staff long enough, there would be no need to change the position of level by carrying it further up the slope, for one central position would be sufficient, and one line, or plane of collimation, would suffice instead of two. The raising or jumping of the line of collimation, therefore, has no effect on the work if the staff between the two positions is accurately held, nor does it vitiate the results of the operation in the least.

THE ARCHITECTURAL ASSOCIATION EXCURSION.—I.

[WITH ILLUSTRATIONS.]

NEXT MONDAY the excursion party will commence their proceedings in the borderland of the Wash, with King's Lynn as a centre, and the head-quarters at the Globe Hotel, one of the most hospitable houses in East Anglia. This district of the Fens is particularly rich in churches, with some rare good roofs and porches, while in not a few of these marshland buildings are to be found some uncommonly good fittings, and Jacobean furniture of a highly interesting character. "This noxious swamp in summer," as Smiles has termed the borders of the Ouse and Nene, not many centuries since was almost entirely abandoned to the waters forming an immense estuary of the Wash, during most of the year a veritable inland sea. Later on, the outlet of this vast water, fed by the Witham, Welland, Glen, Nene, and the Ouse, became closed by the deposit of silt, caused by the meeting of the waters during the process of ages. At Podyke, and at various points near the coast line, the bulwarks and causeways raised by the Romans are still traceable, and the dead-level country is still cut up into parcels by dykes and ditches, dividing the pastures in every direction. The famous days of the Flemings, accompanied as their advent was in this part of the country by the Dutch and the Walloons, did much for the architecture of Norfolk, and most of the magni-



cent stall-work, rood-screens, and their canopies re to be attributed to the prosperity which llowed upon the revolution in trade brought out by the invaders. The absence of stone d, of course, to the frequent use of brick at all eriods, and flint or rubble for the walling of the ief buildings of this district is well known to the rule. In more modern days the bricks of ie Flemings superseded the older Roman tile nape; but for years the original form continued. he earliest example known in England of the ange to the Flemish brick is at Little Wenham all, of the time of Henry III. Previous to that ie Roman tile was the common brick used verywhere, as at St. Botolph's Priory, Colchester. n King's Lynn itself the foreign merchants uilt themselves residences, and enough remains f these buildings to show fairly well their proortions and extent. The town is singularly old-ashioned-looking, with its ancient St. George's uildhall, the Town Hall, Chapel of the Red Mount, and, not least, the Custom House. Lynn as also some gates—one of the college founded y John Thoresby, a good Perpendicular one built into a modern house; one of the Carmelites, a good specimen of brick, with stone dressings of Late Tudor style; and the great South Gate-house, a square, massive structure of 15th-century date, with battlements and two slender octagonal corner turrets. With so interesting a centre, and given fine weather, the excursion of 1889 ought to prove a notable one; indeed, the programme is so crowded with rich specimens, that some, at any rate, will, we fear, have to be omitted to accommodate the proceedings to the limit fixed by the restricted time at the disposal of the excursionists. The following are the places drafted out for the various days:—Monday, Aug. 12, Wiggenhall, (St. Germain's, St. Mary Magdalen, and St. Mary's), West Walton, Walsoken, Wisbech, and Leverington. Tuesday, Aug. 13, Middleton Towers, East Winch, West Bilney, Pentney, Narborough, Castle Acre, Swaffham, Oxburgh, and Stoke Ferry. Wednesday, Aug. 14, Long Sutton, Gedney, Holbeach, Whaplode, Moulton, Spalding, Crowland, and Thorney. Thursday, Aug. 15, Hillington Hall, Harpley, Houghton Hall, Great Bircham, Snettisham, Dersingham, Sandringham, and Castle Rising. Friday, Aug. 16, West Lynn, Terrington, St. Clement's, and Lovell Hall, Walpole, St. Andrew's and St. Peter's, Terrington, St. John and Tilney All Saints. Saturday, Aug. 17, King's Lynn and Ely. It will thus be seen that the week will be a busy one, and the work to be visited extends to the counties of Norfolk, Lincolnshire, and Cambridge, in some places nearly approaching the district included in the programme of the first excursion of the Architectural Association, which was held at Lincoln in 1870 (Aug. 22-27), under the personal guidance of the founder of these annual outings, the late Mr. Edmund Sharpe. Then the churches were divided into three sections. Peterborough, being visited one day much in the same manner as Ely Cathedral, will be taken on the present occasion. By way of furthering the interest of the visit, we give to-day two interior views, photographed lately by Messrs. Poulton, of this great church, showing the choir looking west, and a detail of the vast crossing under the lantern, including in both pictures Scott's chancel screen and new pulpit, with which he enlivened the building.* As a preliminary sheet of sketches in illustration of the work to be seen on this excursion, we publish herewith a double-page sheet of studies of Marshland Furniture, by Mr. E. Guy Dawber. These include the chairs and tables existing in the old Almshouses at Castle Rising, and an altar-table in Watlington Church. The details are eminently characteristic, and being drawn carefully to scale, cannot fail to be useful to our readers. Next week we shall commence a series of plates illustrating buildings in and about King's Lynn, specially contributed to our pages by Messrs. Arnold B. Mitchell, A. Needham Wilson, E. Guy Dawber, John Johnson, W. Harrold Oakley, and Charles Oury King. The excursion will be under the personal conduct of Mr. Leonard Stokes, the president, and Mr. Herbert D. Appleton, the acting hon. sec.

VENTILATION IN AMERICA.

MESSRS. ROBERT BOYLE AND SON, Limited, are at present preparing plans and estimates for the ventilation of the Mormon Tabernacle, Salt Lake City, Utah, and the new Mormon Temple, in the same City, which has been in the course of erection for the past thirty-six years, and is now nearing completion. This building, when finished, will be one of the most remarkable of modern buildings, not only on account of its size and the purpose for which it will be used, but for the immense thickness and strength of its walls, which are built throughout of solid blocks of dressed granite, the basement walls being 20ft. thick, tapering gradually to the top of the building to a thickness of 6ft. The Tabernacle, which is estimated to accommodate fourteen thousand people, besides having the largest unsupported ceiling of any building in the world, is perfect in its acoustics, a pin dropped at one end of the building being distinctly heard at the opposite end or any other part of the building. This phenomenon in acoustics was tested by Mr. Robert Boyle (who has just returned from America), when making his examination of the Tabernacle, and found to be strictly as stated.

Mr. Boyle has also examined the Canadian Houses of Parliament, Ottawa, and the new municipal buildings, San Francisco, for the purpose of submitting improved schemes of ventilation for those buildings. The Pennsylvania Railway Co. are adopting Messrs. Boyle's system, a large number of the latest improved air-pump ventilators being specified for new engine-shops and locomotive-sheds being erected at Altoona, Pa., where Mr. Boyle prepared the scheme in conjunction with the Chief Superintendent of Construction. Tests were made by Mr. Boyle of his system of ventilation applied to the Layton Art Gallery, Milwaukee, Wisconsin, one of the

* The following illustrations of Ely Cathedral have appeared in our pages:—Plans: May 16, 1884, and Jan. 15, 1886; west front, Nov. 15, 1867; west front, photographic general view, July 13, 1888; west tower from south, with college chapel (by J. Donkin), Dec. 23, 1881; the lantern, July 10, 1863; interior of choir, looking east, Dec. 2, 1870; tympanum over south doorway (Prior's entrance), Oct. 28, 1887; bay of nave (measured by E. G. Northey), March 5, 1880; north choir aisle (J. Donkin), Dec. 22, 1882; wall arcading, Lady-chapel (Pugin trav. studentship drawings by Leonard Stokes), March 19 and April 2, 1880; Prior Crauden's chapel (Pugin trav. studentship drawings by W. H. Bidlake), March 6, 1885; altar cross, Aug. 12, 1887; and the Prior's Door, March 4, 1889.

largest and finest art galleries in the United States, presented as a gift to that town by Mr. Frederick Layton, and illustrated in the BUILDING NEWS some years since. The results were most favourable, the system having successfully withstood the test of the sudden and severe climatic changes it has been subjected to since its application to this building. Mr. Layton has since sent Messrs. Boyle the following report, and has also instructed them to proceed with the ventilation of one of his factories in Milwaukee.

Milwaukee, July 21, 1889.

To Messrs. Robert Boyle and Son,
64, Holborn-viaduct, London.

DEAR SIRS,—I am pleased to inform you that your system of ventilation as applied to the Layton Art Gallery, Milwaukee, U.S.A., is entirely successful. Your latest improved air-pump ventilators effectually exhaust the vitiated air, and are found to be entirely free from down-draught—a very important feature. There should be a future for these ventilators in this country, where a good ventilator is so much needed.—Yours, &c.,
FREDK. LAYTON.

Mr. Boyle, when in America, visited all the principal towns in the United States, Canada, and Mexico, professionally, and for the purpose of studying the latest improvements in ventilation in those countries, and the conclusions he has arrived at from what he has seen are that, so far as mechanical ventilation is concerned, America is still no nearer a satisfactory solution of the problem; and this also applies to automatic appliances, which, so far as he (Mr. Boyle) could see, consisted all over the country of practically only one form of ventilator, constructed after the old Emmerson pattern.

Where plain open pipes were used, or covered with a cap to exclude rain, they were generally stopped up to prevent down-draught, they being found in America to be subject to, and unfavourably affected by, the same conditions as in this country, and which, Sir Douglas Galton and other authorities assert, prevents, and always will prevent, the open pipe from being a reliable ventilator, and, of course, a means of ventilation which should, therefore, never be employed.

Mr. Boyle was much struck with the entire absence in the baths in the leading hotels, &c., throughout the States and Canada, of the douche—spray or shower—or any equivalent for such, which, on account of the climate, should be an absolute necessity.

In those countries such a thing as a domestic water-filter is also seemingly an unheard-of article, Mr. Boyle never having come across, or even heard of, one being used in the whole of his travels, though the water in most parts of the States is notoriously bad, and in some instances positively dangerous to partake of. Possibly filters may be in use in houses of the highest class; but even the best hotels are innocent of them.

Mr. Boyle has been led to understand, from interviews he has had with President Harrison at the White House, and other leading American statesmen, that the present Administration is actively interesting itself in all sanitary questions, so that important reforms may be anticipated.

CLOSE OF THE PARTY-WALL DISCUSSION AT COVENTRY.

BY a very large majority the members of the Coventry Board of Guardians on Wednesday decided to stand by their recent action in regard to enforcing 9in. party-walls in all buildings the plans of which are submitted to them for approval. Mr. Goate brought forward a motion to rescind the resolution, arguing that, as the corporation allowed houses of a certain class to be built with 4½in. party-walls, it was advisable for the two authorities to act upon similar lines. He pointed out that, by the decision of the board, 500 houses might be built in a street under the corporation sanction, and that it would be very hard for a man building the 501st to be compelled to have 9in. walls. They must consider whether it was absolutely necessary to have 9in. walls. In the first place, it increased the value and expenses of building a house, and indirectly affected the tenant, because he would have to pay more rent. He denied that he wished to encourage jerry-building, and pointed out that cheap houses run up outside the city did good, because they provided a refuge for the people who thronged the city. He could not see any objection to 4½in. walls being allowed between houses belonging to the same owner, and thought 9in. walls necessary only to separate different properties.

Mr. Snape seconded, because he thought the 9in. walls would only make the rooms smaller. Plaster and paper made the walls very much thicker than they used to be.

Mr. Kendrick supported the keeping intact of the present by-laws. He remembered a time when small-pox was very bad in a certain part of Coventry, and knew of holes being in the walls of the houses, which he believed added to the spread of the disease.

Mr. Snape: If there were holes in the wall, that should have left the small-pox out.

Mr. Loudon thought the subject had been well threshed out, and there was very little else that could be brought forward. He was still of opinion that they should adhere strictly to the by-laws. From observations he had made, he found three forces against the proposition—the capitalists, who thought it would require a little more capital; the speculative builders, who also was anxious to make a little saving; and then there were those who supplied the speculative builder, and they thought it would interfere with their business. All these three forces laboured under a misapprehension if they thought it would interfere with buildings being run up outside the city. He submitted the replies upon this subject he had received from 16 of the leading towns in the country. Of these Plymouth, Portsmouth, Leeds, Liverpool, Birmingham, Cardiff, Derby, Bristol, Cheltenham, Kidderminster, and London would not allow less than 9in. walls to be erected. In Dudley, Oldham, Stafford, Nottingham, and Manchester they did. It had been said there was nothing insanitary to bring against these 4½in. walls; but he thought it a very striking fact, and did not think it needed a very great stretch of imagination to see how they affected the health of the people. For instance, if they took Manchester, the largest city that adopted 4½in. walls, they would find that it was the most unhealthy city in the kingdom, with a death-rate of 27·4 per thousand. He argued that [illegible] sake of recuperation and the renewal of the waste of tissue, that it was absolutely necessary for people to have proper rest at night, and it stood to common sense that a good, sound, substantially built house contributed a very great deal to the health of the inmates. He further argued that 9in. walls gave greater protection against fire. With regard to the expense that was said would result in the tenant paying increased rent, he had found that the cost would be so infinitesimal that it could scarcely affect the tenant at all. He had sketched out a plan of a dwelling house for an artisan, allowing 30ft. in depth and 30ft. in height, or, with out-buildings, a depth of 42ft. altogether. That would give 71 square yards of building, and 71 yards at 4s. per yard came to about £14 4s. By putting in 4½in. walls they would save half the cost, or £7 2s., upon each house, which at 5 per cent. would be about 3s. 6d. a year. So far as the additional expense was concerned, that might be lost sight of completely. Had they waited for outside pressure in sanitary matters they would have been wallowing in the mire as they were thirty years ago, and would be burying people at the rate of thirty per thousand instead of fifteen. He knew some people were quite content to go on if they could save 2d. or 3d. per week; but he was satisfied the action the Board had taken would be a very great addition to sanitary progress. If other public bodies did wrong, and chose to violate certain by-laws of importance, it did not follow they should do so, although perhaps they were a humbler body.

Several other members having spoken, the Chairman said he had, since this matter had been on hand, taken a little trouble to get some practical experience as to the working of these 4½in. wall houses. The first complaint he heard was that, when a working man bought one of these houses, he found it was a very serious injury had been done him, because at the utmost he got only a 2¼in. as his share of the party-wall. If a man bought one of these houses, he repeated, he either bought 2¼in. of the wall on either side, or he only got a 4½in. wall on one side of his house at all. In a row of houses with 4½in. walls he found in one of them a nail 6½in. long had been driven in to hang a picture upon. The nail had gone right through into the next house, and two pictures were hung on both sides of the wall, one on the head of the nail, and another on the point. (Loud laughter, and cries of "That has nailed it up, Mr. Chairman.")

Mr. Snape: That must have been a tenpenny nail.

The Chairman, continuing, said: In the same row of houses a nail driven into a wall had gone through and broke the glass in a hat-stand in the next house, and in another house the noises of the children had prolonged the serious illness of a neighbour. In another house—not in the same row—a cleanly family were greatly annoyed by the visits of certain inhabitants who came through a crack in the wall near the ceiling. (A Member: "Spiders"—laughter.) Working men he had spoken to, said the chairman, were in favour of 9in. walls, and he thought it would conduce to their health and comfort and happiness. Another thing he advocated was the carrying up of the 9in. walls to the roofs so as to prevent the spread of fire.

Mr. Goate, in reply, said he did not think the high death-rate of Manchester could be attributed to 4½in. walls; and with regard to the powerful argument of the chairman, he really thought he had brought forward too long a nail—(laughter)—even for a 9in. wall. A way out of this difficulty might be found by shortening the nail.

Upon being put to the vote only three members voted for the rescinding of the resolution, and the board still stand pledged to carry out the 9in. division wall by-law with respect to every house.

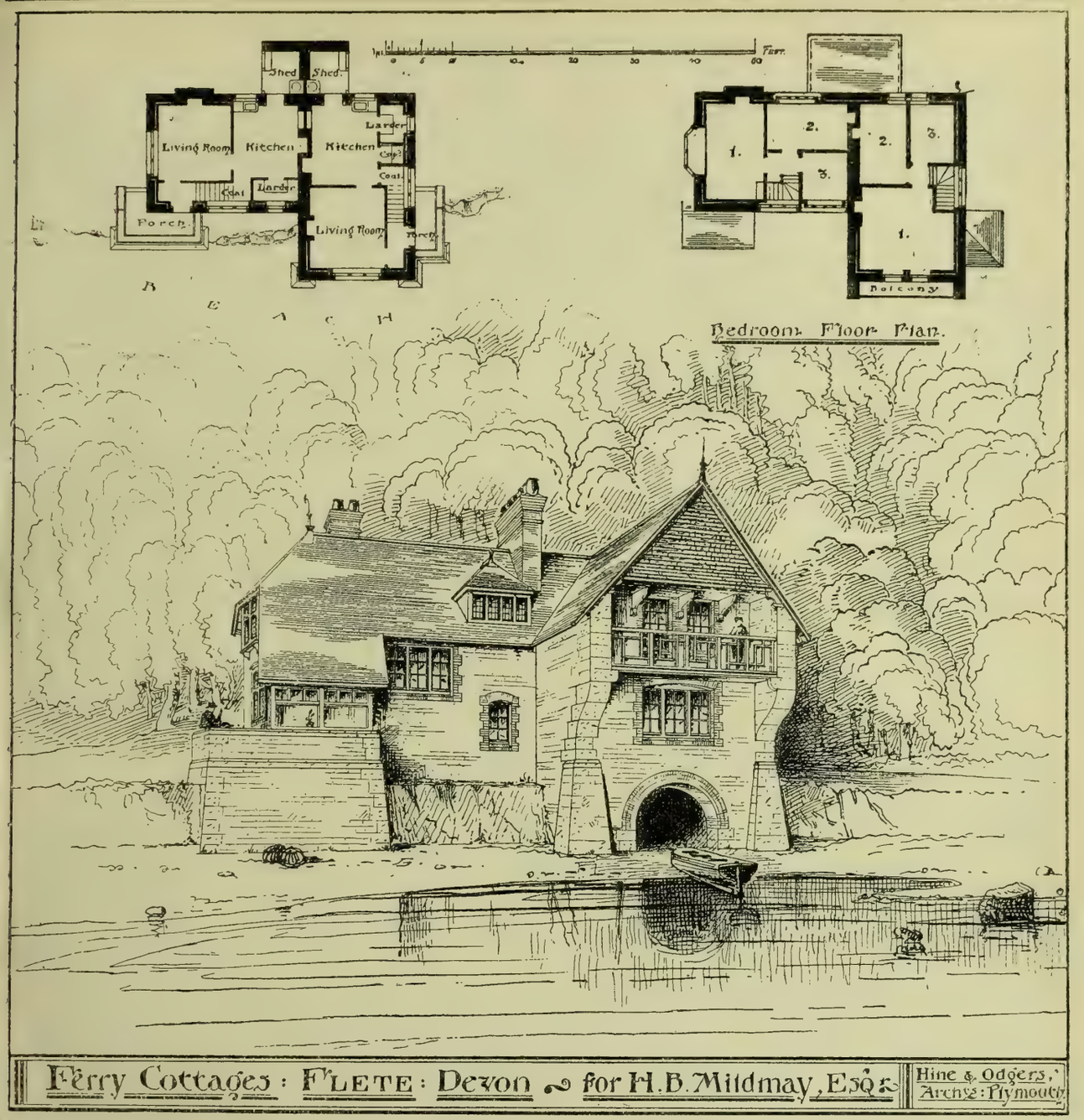
"LA PORCELAINE TENDRE DE SEVRES."

UNDER this comprehensive title M. Edouard Garnier is publishing (Maison Quantin, 7, Rue Benoit, Paris) a handsome folio of fifty plates, in excellent chromo-lithography, illustrating some two hundred and fifty original examples, with an historical notice. The author's admirable drawings do justice to the objects represented, while his intimate knowledge of the subject has enabled him to discriminate with judgment and taste in the selections made for this work, which is a fitting sequel to his "Histoire de la Ceramique." Among the contributors of examples for illustration are the Queen, Messrs. Rothschild, and Sir Richard Wallace, who owns the celebrated Hertford collection. The opening chapter of the volume supplies a summary of the history of the porcelain of Europe, with descriptions of the porcelain of the Medicis, of Rouen, St. Cloud, Lille, Chantilly, Mennecy, and of Meissen, giving typical examples in the letter-press. A complete list of the marks and monograms of the artists engaged in the manufacture of Sevres ware follows the interesting dissertation on its production, and this list is fully illustrated.

Plate I. of the part now before us shows a grand plaque belonging to Mme. Du Barry, painted by Asselin, with turquoise borders. The next sheet includes several specimens from the period of the Revolution, now in the Musée Carnavalet and Collection of M. Sichel. The saucers from the collection of the Marquis de Thuisy; and the dishes and toilette pots belonging to M. Fournier are charming specimens. Domestic ware is not overlooked, and then follow some jardinieres of great elegance from various collections, by Bulidon, Dodin, Vieillard, and other celebrated artists. In each case the marks on the pieces are given in the margin. The work is both thoroughly practical and eminently artistic.

BOOKS RECEIVED.

Old Houses in Wolverhampton and Neighbourhood, by J. B. VEALL, Architect, comprising 20 original etchings on stone (J. Steen and Co., Wolverhampton), is the name of a work which should be sold well in the locality. The examples chosen by the author includes views of the Lich-Gates, the Deanery, Old Lichfield-street, showing houses of the Staffordshire framed brickwork and overhanging stories; Dudley-street, old wattle and daub houses in North-street; the "Old Barrel Inn" of framed brickwork in the upper story, and other old hostelries, many pulled down, as the "Star and Garter." Elston Hall, Bushbury; the Barnhurst, Tettenhall, Pillaton Hall, near Penkridge—a battlemented and formerly moated residence—Dunstall Hall, Boscobel House; Moseley Old Hall—a fine timber-framed house; Dower House, Brewood, &c. These illustrations of old houses, four of which we gave last year, are accompanied by descriptions. As examples of old brick-framed buildings, or timber-framed brick-nagging, Mr. Veall's work will be of in-



terest to the architect and antiquary. —— *Old Cottage and Domestic Architecture* (Surrey, South West), by Ralph Nevill, F.S.A., F.R.I., B.A. (Guildford: Billing and Son), is a reprint in book form of articles and illustrations published in a contemporary. Many new views and sketches are added, and the text has been expanded into a dissertation on the style. The cottages described are chiefly of 16th century and 17th-century date. The remarks on date and style, plan, timber framing, chimneys, roofs, barge-boards, brickwork, and other details are of special interest, as illustrating a humble and neglected field of home study. Mr. Nevill has entered hand and soul into this class of building, the descriptive matter comprising many topographical and other facts. The illustrations include old buildings and cottages in Guildford, Godalming, Farnham, Unsted, Nursecombe, Great Langley, Shalford, and many villages. The brickwork details from Godalming and Guildford, the farmhouses and cottages at Lythe Hill, Witley, Rake House, Compton, Binscombe, Unsted Manor, Nursecombe, Gomshall, Burningfold, Great Langley Manor, Shere, Bramley, many of them illustrative of half-timbered work and brickwork, are very interesting and instructive, and the author's work in this very little known district will repay study. There is a good map of the division reduced from the Ordnance Survey, besides other old maps. —— *Pumps and Pumping: a Handbook for Pump-Users*, by M. Powis Bale, M.I.M.E., A.M.I.C.E., &c. (London: Crosby Lockwood and Son). The author has, in a small compass and condensed form, given the results of experience on a variety of pumps, including steam-pumps, pumps and injector for steam boiler, hand-pumps, centrifugal, rotary pumps, hydraulic rams, &c. The remarks and advice to those who are about to select a pump for a particular purpose are of value. The duties of each type of machine are described. Thus the advice that pumps for sinking purposes should take up little room in the shaft, and should be of the vertical double-acting kind, suitable for suspending by a chain, is important. The pulsometer is recommended for rough work and difficult situations in quarries, or shafts, as it can be suspended and readily raised or lowered. The notes are arranged in the form of paragraphs, with headings. The suggestions are practical, and the book should be in the hands of all users of pumps and contractors of building and engineering works.

FERRY COTTAGES, FLETE, S. DEVON.

THESE cottages are in course of erection at one of the most picturesque points of the river Erone. The lands on each side belong to the beautiful Flete estates of Mr. H. B. Mildmay. The ferry is a very ancient one, and the way down to it is through a narrow pack-horse lane, which has been little disturbed for centuries. The cottages, built chiefly of local stone, are from the designs of Messrs. Hine and Odgers, architects, Plymouth.

St. Paul's Church, Hensall-cum-Heck, was reopened on Wednesday week on the completion of restoration. The structural works have been carried out by Messrs. Biscombe, of York, and the decorations by Messrs. Worthington, of the same city.

A new credence table has been placed in the interesting old parish-church of Almondbury, Huddersfield. It is composed entirely of Caen stone, and is in the Perpendicular style, richly moulded and carved. Mr. John Roddis, Aston-road, Birmingham, is the sculptor, and Mr. E. W. Lockwood, A.R.I.B.A., Huddersfield, is the architect.

St. Paul's Roman Catholic home for boys at Rosshea, Coleshill, Warwickshire, was opened last week. The building is a large solid block consisting of a dining-room, a play-room, a school, a chapel, and a dormitory which has been certified for 86 beds. The architect was Mr. G. H. Cox, of Birmingham, and the builder, Mr. T. Rowbotham, of Small Heath.

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OUR LITHOGRAPHIC ILLUSTRATIONS.

ELY CATHEDRAL.

See "Architectural Association Excursion," on p. 174.

COLSTON MIDDLE-CLASS GIRLS' SCHOOL, BRISTOL.

This school is designed to accommodate 300 girls, and comprises seven classrooms, assembly hall, to be used also as a lecture room and gymnasium, dining-hall, spacious cloak-rooms, rooms for head-mistress and staff, apartments for servants and caretaker, with other usual accommodation. The schools are being built, under a scheme of the Charity Commissioners, by the Governors of the Colston Trust, who administer the funds derived from the benefactions of Colston, the great Bristol philanthropist, who died about 150 years ago. They are intended to supply education for girls belonging to the same class as the boys attending the school that has long existed under the management of the same trust. The buildings are being erected in Cattybrook buff terracotta and light-red bricks, on a basement of blue Pennant stone, the roofs being covered with green slates. The flats and the greater portion of the floors will be of cement concrete and iron joists, the former laid with asphalte, and the latter with wood-block flooring. The assembly hall will have an ornamental open timber roof, and windows of leaded glass. The contractors are Messrs. Stephens, Bastow, and Co., of Bristol and London, and the architect Mr. W. V. Gough, of Bristol.

VALLEY OF ROCKS HOTEL, LYNTON, N. DEVON.

Our illustration gives a view of the additions to the north-west corner (comprising about a quarter) of this building, as designed by the architect, Mr. Rowland Plumbe, for the Lynton and Lynmouth Hotel and Property Company, Limited. The old Valley of Rocks Hotel has within the last few years been added to and altered at four different periods. The two additions first made were built in the local rubble-stone, and with slate roofs; the third addition, that last built—viz., the N.W. corner—was covered with Portland cement in the manner usual at seaside places, that material being the only one that is thought suitable for keeping out the weather in exposed seaside situations. In the present addition the architect has, however, again resorted to the picturesque and many-coloured local rubble-stone for the materials of the walls. It being impossible to dress this stone, red bricks have been used for the quoins, as also for the window arches and jambs. Hygeian rock has been used on the inside of the walls, and they have been pointed on the outside with a weather joint. In addition, the usual soft-soap and alum wash has been applied on the outside surface to render them weather-proof. The building being about 800ft. up the cliff, considerable attention has been given to the skyline; the upper stories and the roof are covered with red and Broseley tiles respectively, with a view of producing a picturesque effect both of outline and colour as a contrast to the rubble walling and colour of the foliage-covered cliffs. The general arrangement of the building will be seen from the plan; the central hall, although not entirely built, was provided for in the last alteration. The dining-room and billiard-room and servery alterations, as also the staircase and the rooms to the north and east of the hall, are part of the present alterations. Should the requirements of the hotel permit, the architect proposes to put an extra story over the two first alterations, the roof and tile-hung walls of which will be designed in character with the new part; at the same time he also proposes to cover the upper floors of the cement-faced part with tile hanging, and to tile the roof at present slated. Should this be done, the whole building will be in character with the part shown, especially when the ivy and other creepers now planted cover the lower parts of the building. In addition to the accommodation shown, there are ladies' drawing and reading-rooms on the first floor, and altogether about seventy bed, private sitting, and reception rooms. The kitchens and servants' rooms are in the basement. It is intended to light the building with the electric light.

DOUBLE COTTAGE, THE GRANGE, CRAWLEY DOWN.

Each cottage contains on the ground floor a living-room, 13ft. by 11ft. 6in.; scullery, 11ft. 6in. by 6ft. 9in., also pantry and closet, and a shed behind for fuel, with w.c. attached. On the first floor there are three bedrooms, the front one in each case having space for two beds. The outside walls are hollow, 15½in. thick, the outer portion being 4½in., and the inner portion 9in. thick, connected with galvanised iron ties. The bricks are Rowfant red hand-made kiln bricks, and the roof is covered with St. John's hand-made tiles. The work has been executed in a substantial and very satisfactory manner by Mr. Samuel Webber, builder, Crawley Down.

HIGH SCHOOL FOR GIRLS, STROUD GREEN.

The building occupies the whole width of the site, and windows in the side walls were allowed only under certain conditions. The principal entrance is by a porch in the front, communicating with a corridor extending the whole depth of the building, having at its further end a second entrance for pupils coming from a road in the rear. To the right of the porch is the head-mistress's room, and to the left two large cloak-rooms, with assistant-mistresses' room, kitchen, &c., beyond. A lift from the kitchen communicates with the pupils' dining-room above. On the first floor are two large classrooms having a wide opening between them, closed with sliding-doors, two small classrooms, and a music-room. On the second floor are three large classrooms having wide openings with sliding-doors, allowing the three rooms to be used as one for special occasions. The front room, for the art and science classes, in addition to the light from the windows, has a large amount of light from a skylight in the northern slope of the roof. On the same floor is a room for the caretaker. The building is faced with picked stocks, with dressings of red brick and Doulting stone. The roof is covered with Sedan slates. The contractors are Messrs. Killby and Gayford, of Finsbury.—Chas. R. Baker King.

COTTAGE AT CHILWORTH, SURREY.

The block-plan in the margin of our illustration shows that this house originally consisted of a single cottage and a pair of smaller ones separated from it by some 21ft. of garden. The problem was to connect the three, and still to maintain coherence and convenience of plan. The new parlour is panelled to a height of about 8ft. in sequoia wood, wax-polished, and the floor is of solid pitch-pine blocks, stained and varnished. The room is heated by means of a German porcelain stove, the underground flue of which is connected with an old flue in one of the pair of cottages. The dining-room is panelled to ceiling height with some 17th-century panelling, originally in Newington Manor House. The cost of the alterations was £600, and the work has been carried out by Messrs. Goddard Bros., of Farnham, under Mr. C. Harrison Townsend, F.R.I.B.A., of 29, Great George-street, Westminster.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Archæologists at Wheathampstead.—A joint excursion of the London and Middlesex Archæological Society and the St. Alban's Archæological and Architectural Society was held on Thursday, the 1st inst. Wheathampstead Church was the first building visited, and here explanations were given by the Rev. Canon Owen W. Davys. Mackereye End House, well known to readers of Lamb's "Essays," was next seen, the quaint brick chimneys, the handsome carved oak chimneypiece, ornamental ceilings, and fine staircase being noted. Some notes on the house and its former occupants were read by the Rev. H. Fowler, and at a later period a lecture was given in a field by the Rev. Dr. Griffith, on "Ancient Common-field Tillage." The ruins of Someries Castle were described by the Rev. H. Fowler, who showed that they were those of Lord Wenlock's house, begun in 1471; and the last place visited was Luton Church, where a paper was read by Mr. S. Flint Clarkson.

Royal Archæological Institute.—The annual congress of the Institute was opened on Monday at Norwich, under the presidency of the Duke of Norfolk, K.G. At noon the mayor and corporation of the city, and the president of the Norfolk and Norwich Archæological Union jointly received the members of the congress at the inaugural meeting in St. Andrew's Hall. In the afternoon Mr. J. Willis Clark, of Cambridge, the president of the architectural section, opened that section of the congress in the nave of the cathedral with a brief history of the fabric, based largely on the publications of Professor Willis, and on the plans drawn up by him 40 years ago. The members proceeded, under Mr. Clark's guidance, to inspect the cathedral, the cloisters, the repertory, the bishop's palace, &c., and subsequently Dr. Bensley took them over St. Giles's Hospital. In the evening the Rev. C. R. Manning, rector of Diss, opened the antiquarian section, Mr. G. E. Fox, F.S.A., reading a paper on Roman Norfolk.

CHIPS.

A group of buildings, including boys' school, chapel, and workshops, are to be built in Exeter-street, Salisbury, for the bishop of the diocese. Messrs. J. Harding and Son, of that city, are the architects.

The tender of Mr. T. H. Smart, of Malvern Wells, has been accepted, at about £2,700, for the laying-out of the new cemetery at Malvern Wells, for the Upton-on-Severn Rural Sanitary Authority. Mr. Ernest Day, M.S.A., the Mayor of Worcester, is the architect.

The inner caisson for the Barry Graving Dock was towed from Chepstow on Thursday, and is being placed in position this week. The caisson has been made by Messrs. Finch and Co., Chepstow, who also made the outer caisson.

The restoration of the nave roof of West Haddon church has just been completed by Messrs. Roberts and Son, builders, Weedon. The work done was to put in new rafters, new boarding, and new lead, the cost of which will be £270. The roof of the south aisle has been also temporarily restored. The work now in progress by the same contractors consists of stripping off the plaster of all the walls, painting the stonework, and restoring all the capital and columns.

The foundation-stone of the Coupar-street Board school, Leith, was laid on Monday. Mr. George Craig is the architect, and Mr. William Baxter the contractor for the building.

New branch offices are about to be built at Cork for the Gresham Life Assurance Co., of London, from plans by Mr. Robert Walker, P.S.A., of that city.

The members of the Bradford Historical and Antiquarian Society paid a visit to Beverley on Monday. The Minster, St. Mary's Church, and the Guildhall were seen under the conduct of Mr. John Bilson, of Hull, who read a paper in the first-mentioned building.

At a meeting of the William Denny Memorial Committee held on Friday, plans prepared by Mr. J. M. Crawford for a building commemorative of the great Clyde shipbuilder were formally approved, and it was decided to erect the premises on a site in Church-street.

Mr. A. B. Brady, A.M. Inst.C.E., who was for many years an assistant to the engineer of the Lancashire and Yorkshire Railway, Manchester, has just been appointed engineer of bridges by the Queensland Government.

WAYSIDE NOTES.

AT a time when all architects who are not up the Eiffel tower, or hard at work at home, are engaged in holiday-making, or directing their energies to attaining this end at the earliest opportunity—at a time when archæological associations are well upon the job in respect to excursions among ancient churches, and when a horde of sketchers invades the precincts of our venerable cathedrals and abbeys—bar St. Alban's, which is now of no further use to students—and at a time when we all feel inclined to exchange city and work for country and recreation, and when the wearied assistants would prefer to be tracing fancy designs on the crisp, yellow sands, than matter-of-fact ones upon their master's greasy linen or cloth—at such a time, I take it, it must be a much-favoured topic indeed that shall induce the reader to keep up that serious study of the literary matter supplied by the ancient "Goth," which, as everyone knows, is the only sure road to success in the architectural walk of life. It unfortunately happens that topics of passing interest are for the moment conspicuous by their absence. Doubtless all are well sick of the St. Alban's controversy, though there may be nothing to take its place. Yet, methinks, there is one topic that will be in season at all times. I fancy that there is something about the question of *professional remuneration* that has its interest for every individual member, except only any latter-day Pugin; and one need not of necessity be a "guinea-pig" to be interested in what, after all, is the original *motif* of one's calling. I therefore think that what Lord Justice Coleridge recently remarked anent the equivalent of an architect's bread and cheese must have been noted with curiosity by many of your readers, both by those arraigned on the pro. and on the con. sides in the great five-per-centum v. *quantum meruit* case.

Quantum meruit is a very fulsome, satisfying, and withal imposing phrase. It brings to mind, too, visions of impartiality, fairness, and general justice to all parties. It does so, at least, in the abstract. Applied to practical, hard, matter-of-fact problems, however, it may not always prove of so great excellence as it appears when viewed in a theoretical light. Employed by Lord Coleridge in the case of Whitmore v. Crabb, Veley, and Co., it is scarcely so happy as it might be. For although in theory we have all, at times, entertained more or less kindly feelings towards plans for remunerating us for our labours according to our respective merits, we have yet found that the £5 per cent. system is eminently workable, convenient in the making out of accounts, and, in the vast majority of cases, well adapted to that most desirable end of getting as much money as possible out of the pockets of the British public without their complaining of excessive charges. Although contrary views are at times expressed on this subject, I yet feel sure that a general concensus of opinion would show a majority in favour of the old custom. The young practitioner feels that under the system he is protected from attempts to encroach unfairly upon his rights, and from any efforts to take advantage of his insecure position and uncertain foothold; while his elder knows that hesitating, would-be clients will not deprive themselves of his assistance because they fear his charges will be excessive.

From the art point of view, Lord Coleridge's principle would be the most satisfactory. Such, at least, has been the position of many who have written upon the subject, though, for my own part, I should be inclined to doubt its action in many ways. Whatever may be the future result of the occasional discussions on the question of professional remuneration, it is certain that the present system has been found beneficial to the average all-round architect, who doesn't build cathedrals more than once a month, and seldom, or never, expends his time on the minutiæ of furniture and decoration. As a matter of fact—and as I was recently told by a gentleman who does as much, and as good, work in this latter line as anyone—it is easy to get 10 per cent. when one is really worth one's salt, and in good materials this should pay. It does not, therefore, appear to me that that urgent necessity for reform that some have thought. If the reformers like, they may make it 10 per cent. for all works; but let us, at any rate, stick to one plan, and charge either by percentage of uniform scale, or be as free as artists and sculptors. By knocking off the ½ per cent. for receiving tenders, Lord Coleridge, though leaving the bread and cheese, takes away the onion. But such a method of dealing with claims for professional fees will not, it is hoped, become a precedent for future cases.

The best argument for the present system of charging, and one which is indeed not to be lightly ignored, and one, too, which is good both from the standpoint of the architect and of his client, is the fact that, with the commission fixed, the latter knows from the first what the approximate little bill of the architect will be. This really is of the greatest benefit to the *business* of an architect, and, an architect being a business man, even when he doesn't pretend to be, it is essential that he should conduct his office and duties in a business-like manner. I believe many squabbles over accounts are the result of a want of tact in making them out. As my old and lamented friend, the late Mr. W. G. Bower, used to say, there is a great art in making out an architect's account. From the nature of the various charges, and the different ways in which they may be set down, the account may seem modesty itself; or, on the other hand, of such an offensive, aggrandising description as to "set the back up" of even liberal patrons.

The assessor of the Richmond municipal buildings competition seems to have contradicted his own assertions in one and the same report. I was not a little puzzled in my endeavours to reconcile two paragraphs in the report which you published in your last impression. "Architecturally," says Mr. Edmeston, "the design (of 'Westward Ho') is in some respects superior to 'Q. E. D.'s'; but the cost would considerably exceed the stipulated amount, and but for this I should have placed 'Westward Ho' first." Towards the end of the report, the assessor writes: "The instructions state unless the building can be carried out for £10,000, or 10 per cent. beyond, the competitor will be disqualified from receiving any premium. It appears to me, however, that the accommodation required by the instructions could not be properly provided in a suitable building for the sum named, so that this stipulation might be in fairness relaxed." Now this seems to me a very unsatisfactory report, likely to lead the vestry into a policy of indecision. The report has been adopted by the vestry; but I question whether any comment has been made upon it. If they receive Mr. Edmeston's list in the order therein set down, things should go smoothly; but if, after further consideration, they should think fit, in view of the assessor's opinion on the restrictions as to cost, to overthrow the award, there will be something heard from the competitors. Fortunately, the silly season is approaching, so you might perhaps be better able to afford room for the grievances of competitors. It is to be hoped, however, that there will be no occasion for their voices to be heard. The burden of the tales told have a wearying semblance.

The Society of Architects goes pic-nicking in a week or two, and I sincerely hope all the members will have a good time. I wonder, though, whether the Society would be bettering itself if it dropped the rambles of the ordinary archæological associations? Suppose that, instead of making a holiday in this way, they took a tour of the country, looking up new pieces of plan, design, and construction worth examining, with an ultimate view to the development of the scientific side of architecture, would it not be much to be commended for so doing? This time of the year, as I said above, the archæological excursions are all over the place, and the thing is so easy and pleasant. I do not wish to be supposed to be hypercritical of the Society and its doings; but having watched its progress since its formation with great interest, I have always endeavoured to concern myself in its welfare. And the great hope of those who had, and have, the interests of the Society at heart, are that it may become an eminently practical body devoted to the advancement of architecture as a progressive art. I quite believe I am too narrow in this view of an outing, which is intended, primarily, I expect, as a holiday. But seeing in the programme that docks and ironworks are included in one day's excursion, it occurred to me to suggest that, inasmuch as every archæological society tours about among old buildings, would it not be a good idea to have such an outing devoted to viewing docks, ironworks, &c., &c., throughout. I have now in my mind my own experiences in Continental touring. It has often occurred to me that, if instead of staying a half-day to sketch a little bit of detail in an old church, I had expended the time in scanning, say, only the new public works in the town, would not the benefit to myself, and any possible benefit to the community at large, have been greater in the latter case? Perhaps not; I only offer this as a suggestion to be slashed at as anyone may fancy.

There might be some reason for arguing that as the Society has hitherto devoted itself to questions of really practical import in a more energetic and constant way than any other body composed chiefly of practising architects, it therefore deserves to spend its time in that way which never fails to entertain the enthusiastic architect. Anyhow, it has accomplished a good deal in its brief existence, and when the Registration Bill is pulled through it will be a feather in its cap of which it may be proud. Among other eminent practical notions of the Society, I did hear that it was intended to turn attention to the state of the law regarding ancient lights. I have heard nothing lately about this, however; but trust that the project, if attended with any prospective success, will not be abandoned.

Touching the question of the town holdings in your articles on "The Leasehold System, and its Alleged Advantages," you very truly give the reasons for the resulting opinion of the committee. To know "that nearly all the witnesses in favour of short or terminable leaseholds were land agents, surveyors, or solicitors, who had, by their own admissions, a personal and direct interest in that system," is to be enlightened as to much in the report that was otherwise puzzling. Mr. Lawson's report gives the cause of the evils of jerry-building. Whilst there are so many pulling the wires comfortably behind the scenes, and using the speculator as the monkey used the cat's paw, the evil may be expected to continue. A fine, fat building estate in a rising neighbourhood is a rollicking business to land-agents, surveyors, and lawyers; and it doesn't follow that Mr. Buggins shouldn't also grow sleek over the same prize. But he plays second fiddle, and grows rich by diligently picking up crumbs. The solid meat goes elsewhere. It seems to me that what is now required is another committee to inquire into the report of the first committee. The root of the evil has scarcely been laid bare. Until it is exhibited to the public gaze little good will be done. Its exhibition may disgust, but won't eradicate, however. Further steps would be required to ascertain even the possible way it might be eradicated. I see it is a long job.

GOTH.

CHIPS.

The volunteer fire brigade of Newport, Mon., have this week moved into their new station which faces the Dock-street front of the town hall. The premises were formerly two Corporation cottages, and they have been reconstructed for the purposes of the brigade under the supervision of Mr. R. H. Haynes, lieutenant of the brigade, and assistant borough surveyor.

A new chapel is in course of erection at St. Mary's Convent, Roehampton. It is dedicated to the Immaculate Heart of Mary, and is being built from plans by Mr. A. E. Purdie, of Brook-green, W.

Special services were held at Christ Church, Clevedon, on Friday, in commemoration of the opening of the church on August 2nd, 1839. A series of improvements have been made in celebration of the jubilee, including the reglazing of the whole of the windows (excepting two memorial ones), with cathedral glass, by Messrs. Jos. Bell and Sons, of Bristol; the erection of an elaborately-carved pulpit and reading-desk by Mr. F. Bell; and brass Communion-rails by Messrs. Singer, of Frome.

The new tramway line from Leeds to Roundhay Park having been inspected last week by Major-General Hutchinson, on behalf of the Board of Trade, was formally opened on Monday. It has been laid out under the direction of Mr. Thomas Hewson, the borough engineer.

Mr. Alfred Beaumont has been appointed surveyor to the East Riding county council in succession to Mr. J. L. Webster, resigned. The salary is £120 a year, with an allowance of £60 for travelling expenses.

Building Intelligence.

Troon, Ayrshire.—A new church, erected in St. Meddan's-road, Troon, for the United Presbyterian congregation, has just been opened by the Rev. Dr. Taylor, of New York. The church seats, in nave and gallery, over 600 persons, and there are also a hall, ladies' room, vestry, &c., in connection. A fine organ, by Messrs. Mirrleis, of Glasgow, has been placed in the church, and was used in the opening services. The buildings are of dark red freestone from Ballochmyle quarries, the style of architecture being 14th-century Gothic of a Scottish type, and the tower and spire rising over 120ft. forms a conspicuous feature. Mr. John B. Wilson, A.R.I.B.A., Glasgow, was architect for the works, the contractors being all local. The total cost, inclusive of organ, bell, &c., is under £4,000.

Tynemouth.—The Victorian Jubilee Infirmary was opened by Earl Percy on Saturday. Of the complete design the west wing and the greater portion of the administrative block have been erected, the east wing and central tower being omitted for the present. Opposite the main entrance is the staircase leading to the first floor, with a corridor 6ft. wide branching east and west from the foot of the stairs. On the east side of entrance is a board room, 16ft. by 14ft., and on the west the matron's sitting-room of similar dimensions. At the opposite side of the corridor to the matron's room is the bathroom, and a large linen store closet. The operating room at the rear is 16ft. by 14ft., lighted from the top as well as the sides. At the north-east part of the centre block are placed the kitchen, pantry, and larder, and washhouse. The main corridor has a total length of 104ft., and is heated by hot pipes. There are two isolation wards and two nurses' rooms, each 12ft. by 11ft. The male ward is 32ft. by 24ft., and contains eight beds, and is 13ft. high, giving 1,248 cubic feet per bed. The female ward contains six beds, and is 26ft. by 24ft. The bricks used are red, with red brick arches to all openings, and the foundation walls up to ground level are of cement concrete. The roofs are covered with green Cumberland slates. The contractors for the whole of the works are Messrs. J. and W. Simpson, of North Shields and Blyth. The architect is Mr. F. R. N. Haswell, of North Shields.

Engineering Notes.

The Dee Bridge.—The new swing-bridge over the Dee, the largest structure of its class in the kingdom, was formally opened by Mrs. Gladstone on Saturday. It is four miles below Chester, and forms a link in the new direct route of the Manchester, Sheffield, and Lincolnshire Railway into North and South Wales. The bridge has, besides two fixed spans of 120ft. each, a swinging girder 287ft. in length, 32ft. deep in centre, and 16ft. in height above high water, and gives a clear width of open span of 140ft. Sir Douglas Fox and Mr. Francis Fox, of Westminster, were the engineers, and Messrs. John Cochran and Sons, of Westminster, were the contractors; while the contractors for the railway connecting the Cheshire lines system with the bridge were Messrs. Logan and Hemingway, and for the Hawarden loop line Mr. Woolley.

A mission-hall for St. Gabriel's parish, Liverpool, erected from designs by Mr. George Bradbury, of that city, was consecrated last week. It consists of a large room seated for 550 persons, a lecture-hall holding 150, two class-rooms, and a vestry. Messrs. W. Thornton and Sons, were the builders, and the cost was £2,800. Much of the masonry is of stones from the old parish church of St. Peter's, Woolton, replaced by a new fabric last year.

Memorial stones of a Wesleyan chapel were laid at a site in the Walsall-road, Willenhall, on Monday week. The chapel will seat 400 persons, and will cost about £1,700. Mr. Ewen Harper, of Birmingham, is the architect; and Mr. Thomas Tildesley, of Willenhall, the builder.

Trinity United Presbyterian Church, Saltcoats, was opened on Friday. The church is in the Early English style. The principal front is towards Dockhead-street. There are sittings for 450 persons, and the cost of the church is over £2,000. Messrs. Baldie and Tennant, Glasgow, are the architects.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Received.—H. S. and Co.—W. E. R. and Co.—J. B. T.—J. L. and P.—C. H.—D. D. and Son.—C. H. B.—R.—W. R. O.—M. L. and S.—H. T. and P.—E. F. and B.

Correspondence.

THE ARCHITECTS' REGISTRATION BILL.

To the Editor of the Building News.

Sir,—The publication by the council of the Institute of reasons against the second reading of the Bill, is one of those curious phenomena which cannot readily be accounted for, but which have to be accepted with what grace the profession possesses. Neither the majority of our craft, nor the House of Commons, are likely to be prejudiced against the Bill by this manifesto. Facts are against the council, facts which must come to the knowledge of the gentlemen responsible for their reasons as constantly as they do to others of us.

The following is one of the many such facts which have come to my knowledge within the last few months:—A widow with a family of seven children took a lease of a newly-built house at a rental of £130, in one of the largest and best managed watering places in England. The house was in plan and construction superior to the general run of speculation buildings, and so far as the drainage above ground was concerned, was also above the average. The main principles now obtaining among sanitary scientists had been adhered to. The family take posession, but in a short time it is discovered that a stoppage has occurred underground, and that the sewage has forced its way back through all the basement traps, with the result that one member of the household has diphtheria, two others have the low-fever stage of the same terrible malady, and the others all have diphtheritic sore throats. An examination below ground shows that no grease-trap has been provided, an antiquated and a very defective type of siphon has been used at the junction of the house-drains and road sewer which became stopped by congealing grease. The sanitary authorities of the town had inspected and passed the house as well drained. Here is, to my mind, another clear case of ignorance of the technicalities of house drainage.

Our Bill carefully provides that, after its passing, no officer whose duty it is to prepare, examine, approve, or pass plans of buildings and their constructional or sanitary arrangement, or so far as concerns their safety from fire or their convenience of exit, shall be appointed to these posts unless qualified by examination under the Bill. Such a provision strikes to the root of the evil, and gives the public the only possible guarantee of efficiency in these all-important officials.

We hear of a Registration of Buildings Bill, the object of which is to oblige every owner or tenant under a penalty of ten pounds to have his or their building surveyed, put into proper sanitary condition, and professionally certified to be so. What is the use of compelling the public to lay out large sums on drainage before you have provided them with a body of practitioners, thoroughly trained to inspect, direct, and certify reliably?

The Architects' Registration Bill would accomplish this; it would qualify the profession (numbering about 10,000 men) whose function it is to control such matters, and would do this at their own expense. When this army is well equipped, it will be time enough to try whether Parliament be disposed to legislate to provide it with work. This Registration of Buildings Bill lays down certain generally-admitted principles of house-drainage, water-supply, &c. This is a mistake: qualify your men and make them responsible, but do not encumber your Bill, nor check invention by clauses attempting to enforce uniformity of method. In the case I have alluded to, every one of the principles of sanitary science laid down in that Bill was complied with, yet the system failed for want of technical knowledge.

Referring again to the Institute's reasons against the Registration Bill, its main argument of course is that it has a charter under which it is examining all who care to qualify themselves; but does the Institute really suppose that it can by this system of voluntary examination, ever secure the membership or the qualification of the vast body of the profession (especially of provincial architects)? If so, any reasonable man can see that such a hope is destined to disappointment, whereas directly this Registration Bill becomes law, it will make the R.I.B.A. veritably omnipotent in the architectural world, for it will then become the only examining and registering body for the United Kingdom.

Too much emphasis cannot be placed on the fact that the Registration Act Committee have adopted the very policy which the Institute has been worked upon since its conversion to the principles of compulsory test examinations. The difference between the two bodies is that the Registration Act Committee desire to see this qualifying examination made compulsory upon the entire profession, instead of allowing it to remain, as now, optional.

Some years since the Institute announced that after a fixed date it would close its doors to all seeking associateship who had not passed the test examination, and this policy will also in a few years be extended to the class of fellows. The result has been that the two classes of members have recorded a very large increase in the interval between the issue of the notice and the date of establishment of the examination. The Institute in that interval has been obliged to accept the best evidence of qualification it could get; this is precisely what the Bill provided for, only extending it to the entire profession.

Before the statutory examination is applied, all claiming registration will have to make a declaration under oath that they have been for so long in practice as *bonâ fide* architects. We therefore challenge the R.I.B.A. council to produce a single argument against this Bill which is not in opposition to the main principles it has long since adopted in its own government; its opposition surely cannot be actuated by so unworthy a motive as the fact that this great movement has originated outside its walls, yet the ugly conclusion proclaimed by its own reasons against the second reading is that no greater reason can be adduced. Such a conclusion, however, appears illogical in view of the oft-declared readiness of the present promoters to hand the work over with necessary stipulations to the Royal Institute, which is clearly, in virtue of its standing (as well as on account of general

professional feeling), the proper body to carry the measure into the House.—I am, &c.,

A Member of the
Architects' Registration Act Committee.

THE ARCHITECTURAL ASSOCIATION.

Sir,—The enthusiastic letter of Mr. Earle's, which you published in your last week's issue, must have thoroughly awakened the interest of the members of the A.A., and I should imagine of a large number of the profession who do not happen to belong to that educational body.

Such a radical change in the constitution and working of the A.A., as is contemplated by Mr. Earle, must naturally appear visionary to some persons, until further details are provided to convince sceptics of the scheme being a practicable one; but I hope that all who doubt its feasibility will hesitate to denounce it until opportunities have been provided for thoroughly discussing the matter.

The outline proposals now before us indicate an appeal to the public for funds, which may or may not be desirable, but some fresh lever will have to be applied before the popular mind can be induced to interest itself in architecture. Mr. Earle seems to have given this important point his careful consideration, and if influential patronage can be obtained, perhaps the apathy of the public may be removed, and the proposed sum of money obtained.

The professional education of an architectural student is at present conducted under very adverse circumstances, and if it prove possible to find a thoroughly representative educational body under the flag of the Architectural Association of London, a growing and serious want will be supplied. It, however, must surely seem a little strange to a discriminating public to observe that the important institution which has brought about an obligatory examination in Architecture for all young men wishing to participate in its privileges, has not yet shown any disposition to inaugurate the means by which the special training and education are to be obtained. The active support of the R.I.B.A. is most essential for the scheme, and little assistance could be expected from outside unless such support is vouchsafed.

I look forward with keen interest to the publication of further details in furtherance of Mr. Earle's proposals, as I consider them worthy of our fullest consideration.—I am, &c.,

A. O. Collard.

ST. ALBAN'S CATHEDRAL.

Sir,—"Ars," who, it is generally admitted, believes he knows everything, was probably fully posted in the fact that I was away in Africa, and not likely to see, at the time of publication, several statements of his that, unreasonable as they are, I am now tempted to deny. He knew, too, that I was due home again last week, and so, after making assertions more or less untrue, he adds:—"And now, Sir, as for some weeks I shall be out of reach of my Building News, I wonder if my adversaries will have the chivalry not to stab me in the back during my absence." In point of actual fact, the assassin wonders there are other cowardly people of his own particular character about!

It is not on any of the various thing connected with the abbey, and on which "Ars" has given an opinion, that I wish to trouble your readers. If "Ars" does not like the work I have had intrusted to me at St. Alban's Abbey, so much the better, and I am more than content in the knowledge of the fact. We never expect to please everyone. Some must take exception thereto, and it is satisfactory to know that I do *not* please "Ars."

But in the letter referred to, "Ars" reiterates what he has already said before, that I (or as he puts it, "Hems and his friends") never saw—certainly not till recently—the statues on the west ends of the Cathedrals at Cork and Salisbury.

In reply to this, I can only say I have visited Cork, on an average, once a year for the last quarter of a century, and that I have been connected in some way with nearly every public work at Salisbury for the past twenty years. Further, when poor Redfern, Salisbury Cathedral's sculptor, died, his widow fell into pecuniary straits, and on the representation of a mutual friend, I purchased the original models of the statuary of her, and for the last ten years or so these have occupied a place in my studio. They are there to-day.

So, much for "Ars'" veracity upon things outside St. Alban's.

I only care to touch upon one thing directly connected with the Abbey. I have not seen the Building News for 13th of July. My copy followed me to Morocco, but failed to catch me. I am assured, however, that "Ars," amongst much else, remarks therein, somewhat ambiguously, that reason exists to "regret that the sculptor's family ever came" to St. Alban's.

Perhaps when "Ars" returns (if he really *has* gone away!) he will explain what he means by this? I happen to be the happy father of a fairly large family; but, with one exception, none of its members have been to St. Alban's. The exception in question is Greville C. Hems, my eldest son, who, for the best part of over six years, has been engaged upon the high altar screen in the Abbey. During the whole of that time he has enjoyed the respect and friendship of a wide circle of friends, and for a long while, and at present, is a member of St. Stephen's Church choir at St. Alban's. It is more than probably that the only person who regrets his presence is "Ars" himself, for it is no secret that some little time ago he was the means of frustrating a mean and ungentlemanly action, that "Ars" was certainly indirectly, if not directly, implicated in.

Every reader must see that "Ars" has thrown a great deal of trade feeling and jealousy into this correspondence, and I am sorry that it is so. Certain it is that I never asked permission to do the work I have now so nearly completed. It came without my seeking, and the first intimation I had that I was to undertake the renovation of the high altar screen at the sole expense of Mr. Henry H. Gibbs, and under the direction of Mr. (now Sir) Arthur Blomfield, A.R.A., was through the medium of one of the trade papers: I believe the Building News!

"Ars" roundly asserted that he *knew* I have never been to Salisbury or Cork, and tried, by innuendoes, to throw reflections upon my family.

Probably after this explanation, readers of the Building News will be able to be in a better position than before to weigh his other utterances precisely at what they may be worth.—I am, &c.,

Exeter, August 6. Harry Hems.

Sir,—In reference to the statement by "Ars," in your 26th ult. and previous issues, we beg leave to say that there is not, and never has been, a "white marble cross" in the great screen in Winchester Cathedral. A plain, thin, wooden, Latin cross was at one time erected with a view of ascertaining its general effect, but we cannot conceive that this could possibly have been mistaken for the "handsome white marble cross" mentioned by "Ars."

With regard to the general restoration of the screen, although the drawing originally made by Mr. Sedding (exhibited in the Royal Academy) embraced the whole structure, Mr. S. was only engaged in superintending the carrying out of the centre portion (forming the memorial to the late Archdeacon Jacob), which was executed by contract, and with the exception of the statues, was completed early last year. The remaining portion of the work has been subsequently carried out by the chapter's local staff of masons without making use of Mr. Sedding's drawings whatever, from detailed drawings designed and executed by Mr. G. H. Kitchin, the dean's son.—We are, &c.,

John Colson, F.R.I.B.A., and Son,
Surveyors to the Fabric of Winchester Cathedral.
Aug. 6th, 1889.

Sir,—To read "Goth's" remarks last week, one would imagine that he was about to do us some tremendous favour, and one that we had asked for, too; but as a matter of fact it was *he* who announced his intention of visiting St. Alban's Abbey, not *we* who asked him to go. It is a pity he made such a rash promise before he had calculated the cost of the trip, "taking up his own time"; but when he attempts to make it appear that his going or not going can be of any interest to us, he talks nonsense. His verdict cannot possibly affect us, because we can absolutely prove what we have stated; but it *can* affect himself and your other correspondents, inasmuch, as *if* he is able to see the inaccuracies, he has pledged himself to acknowledge them, and thus put an end to the controversy. It has escaped "Goth's" attention, apparently, that if we particularised every single inaccuracy in the Sheet of Contrasts he would be no wiser until he had seen the building, and compared it with the drawings. We do not "fight shy of detailing the inaccuracies in the drawings," but "Goth" *does* "fight shy" of the "ancient painted ceiling," and not one of your other correspondents will even venture to mention it; and again we say that thereby they prove our case. A little knowledge is, in truth, a dangerous thing, and never was it better exemplified than in "M.'s" letter. We beg to offer a small contribution to his store by informing him that "Ars" *did not* "exaggerate the expenditure to £80,000." He said Lord Grimthorpe had expended £60,000 in six years, and, in a later letter, spoke of his lordship having expended £80,000 on St. Alban's Abbey, which, to our certain knowledge, is perfectly true. In addition to this, we venture to "parade" our "small smattering" to the extent of stating that we have paid far more than the £30,000, which "M." has decided "as men of business we cannot go beyond" in hard cash, for wages alone. So much for "M.'s" knowledge, and we congratulate him on his valuable contribution to the subject under discussion.—We are, &c., Wm. Longmire and Co.,

34, Osnaburgh-street, Regent's Park, N.W.,
London, August 7th.

CHURCHES WITH CHANCELS NOT IN THE SAME AXIS.

Sir,—Among the seventy-nine churches in this archdeaconry of Lindisfarne there are but two ancient ones which have a deflection in their chancels—namely, at the parish church here, and at Hartburn, in the Morpeth district. Both of these chancels have a very marked deflection, both northwards. The former-named chancel is of the Perpendicular period, large and handsome, with both south and north chancel aisles, with arcades of three arches. The chancel of the latter is of the Lancet period. It is 48ft. 6in. long and 16ft. 6in. wide, and it has no chancel aisles.

The impression among Catholics is that this deflection of chancels represents symbolically the leaning of the head of our Saviour upon the cross. But this can hardly be so when the instances are so few. Several chancels in this archdeaconry were either rebuilt or lengthened in the Early English and Lancet period, yet in only one—this at Hartburn—was any deflection then made.

I am inclined to think that, through some practical obstacle or difficulty, these chancels were designedly deflected, just as in the case of a chancel I have rebuilt for Merton College at Embleton, where, in consequence of some railed tombstones outside being in the way, I preferred to give the chancel a strong, marked deflection to the north.

Builders made curious mistakes in Mediæval times. There are two churches in this district whose naves are, by about the width of the columns of the arcades, wider at one end than the other, evidently caused by an error in setting out the work. The deflected chancels may have been so made in error of setting out.—I am, &c.,

Fredk. R. Wilson,
Diocesan Surveyor for Lindisfarne (Author of "The Churches of Lindisfarne").
Alnwick, August 3.

THE MOSQUE AT WOKING.

Sir,—Referring to your illustration and particulars of the above, perhaps it would interest your readers to know that the dome is covered with Vieille Montagne zinc, and the finial and crescent with copper, the whole (including woodwork) being executed by Holden and Co.

5, Wood-street, Westminster, S.W., August 7.

On Thursday, the 1st inst., Colonel Walter Mardon Ducat, one of the inspectors under the Local Government Board, held an inquiry at Long Eaton, Notts, respecting the application by the local board to borrow £8,050 for purposes of street improvement, sewerage, and sewage disposal, construction of a chapel at the cemetery, to provide a fire-escape, and to discharge several loans. The surveyor placed before the inspector plans of the proposed street improvements and of the alterations to be made at the sewage farm, where two new sludge presses are to be placed, and Mr. Knight, architect, explained the plans of the new cemetery chapel.

A group of schools are about to be built at Clarendon Park, Knighton, near Leicester, from plans by Messrs. Everard and Pick, of Millstone-lane, Leicester.

Intercommunication.

QUESTIONS.

[10056.]—**Wenlock Priory.**—I shall be pleased to know if I can get the plan of Wenlock Priory, in Shropshire, in any publication.—M. C.

[10057.]—**Pumping.**—Would any of the readers of the Building News who have had practical experience of pumping inform me if there is any difference in the weight or pressure on the pumps if the ascending main delivers in bottom of upper reservoir instead of over the top?—there being a dispute with regard to that, I holding that if the pipe delivers in bottom the pressure on the pumps as the upper reservoir fills increases, and causes a great waste of power that might be saved if delivered over top instead. The height of reservoir above is 170ft., and reservoir holds 100,000 gallons when full.—St. Andrew.

[10058.]—**Easements.**—My question last week should read thus: Has the law relating to easements been altered lately? A solicitor told me recently the twelve years were *now* sufficient to acquire a right.—M. S. A.

[10059.]—**Price of Fir Timber Scantlings.**—I suggest to myself to value these in day-work bills, forming part of the statement of variations following a lump-sum contract, thus:—I put down a farthing per inch of section per foot run + a constant of two farthings, so as to allow for extra sawings in small sizes—*e.g.*, 8in. by 2in. at 4½d., 5in. by 2in. at 3d., 2in. by 1in. at 1d.; this would be equal to 3s. per foot cube + ¾d. per foot run on each size. But as this is for supply only on the building, but no labour or nails, and as the price in quantities for yellow fir framed and fixed in roofs and floors is 2s. 3d. per foot, what deduction should I make from the result of my above pricing of scantlings to bring down the price proportionate to the 2s. 6d. per foot—that is, deducting for hoisting, labour, and nails? Scantlings to be measured as fixed, without allowance for waste in length, but wide allowance for gauge of saw. Would a deduction of one-third be fair? This would bring the scantlings to 1s. 8d. foot cube + ¾d. per foot run of each size, large or small, for sawing and waste. It must be remembered that scantlings so measured often use up waste from the contract work. It is a curious anomaly that many builders require more money for scantlings without labour or nails than they do for fir-framed and fixed.—Z.

[10060.]—**Vitriol Store Floor.**—I have been told to use white lead and plaster of Paris mixed with ballast; but I do not care to do it without knowing proportions. Any help will greatly oblige.—E. X. D.

[10061.]—**Lime and Cement.**—I shall be glad if any correspondent will inform me if mortar composed of 6 parts of sand to 1 of Portland cement and 1 of ground blue Lias lime for repairing and part rebuilding the top of a 14in. brick boundary wall, also for fixing coping on same, makes the strongest work, or if it should be either all lime or all cement? I should also like to know, if the mortar is made as above described, whether the lime would have a destructive effect on the work when completed, and in what manner? Two mixings would, I presume, be necessary.—C. W. S.

REPLIES.

[10039.]—**Right of Way under the Altar.**—Your correspondent "M." appears to have forcibly and satisfactorily replied to "Churchman's" query. I inspected Hythe Church thirty-five years ago, and my impression was, and is, that the crypt was anciently a chapel, used in post-Reformation times—when its former use was disallowed—as a charnel-house. The opening of new entrances and the closing of old ones has taken place again and again in various churches without any faculty or due authority. This has been the case—*e.g.*, at Dorchester Abbey, Oxon.—Frederick George Lee.

[10044.]—**Churches with Chancels not in the same Axis.**—The hypothesis referred to by C. Seth-Smith respecting the direction of chancel pointing to the rising sun on the saint's festival—not "natal"-day—is commonly known; but, like the "right-of-way" theory also under discussion, is evidently invented to meet the case. There are several common-sense arguments against the notion—1. If there was such principle at basis of the matter, why should not important churches be so treated as well as the inferior ones, and why so few even of the latter? 2. In honouring the saint, why was not the whole church made conformable to the rule, instead of distorting the building by twisting the chancel? I think that is a poser. 3. Why should they do such a useless thing? for its existence can only be known by a plan drawing. The building neither outside nor inside manifests the variation to the eye. I do not believe that any case in support of the theory of saints' day divergence has been proven.—M.

[10052.]—**Easements.**—The Prescription Act of 1832, which is the law relating to easements, has not been altered since its enactment, and although the Property Limitations Act, 1874, limited the right of action to recover land to twelve years, yet it has never been applied to the acquisition of easements, and probably will not be so construed.—R. Watson.

[10055.]—**Marine Houses.**—It is very improbable that "D. B." will make his houses thoroughly dry, no matter of what ingredients his plastering is composed, unless he resorts to the expedient of battening the inside faces of the exposed walls and lathing and plastering on same.—R. Watson.

The Glasgow town council have raised the salary of Mr. Foulis, the gas-engineer, from £1,000 to £1,250 a year. Mr. Foulis's salary had not been increased for seventeen years, and during that time the gas made had increased from 1,631,000,000c.ft. in 1873 to 2,905,000,000 at present, while the accounts had doubled. The leakage had been reduced from 19·7 per cent. in 1873 to 10·1 per cent. last year, meaning a saving on the year of £35,000.

LEGAL INTELLIGENCE.

Action for Overtime by an Assistant Surveyor.—Simpson v. Mayor of Leicester.—In the Leicester County Court last week, before His Honour Judge Hooper, Mr. W. H. Simpson, surveyor to the Blaby Rural Sanitary Authority, and late assistant-surveyor to the Leicester Corporation, sued the Mayor, Aldermen, and Burgesses of Leicester for the recovery of £50 on account of overtime in connection with the main drainage works in 1887. It transpired that however well the Leicester Corporation pays its principal officers it is not lavish in salaries to subordinates. Plaintiff had been in the service of the corporation since 1877, and had charge of the drainage works under Mr. Gordon, recently appointed engineer to the London County Council, and in consideration of the arduous nature of his duties his salary was advanced from £150 to £200 a year. His case was that under the direct orders of Mr. Gordon he had repeatedly and indeed constantly to work overtime. He was often called up at nights to set out roads, and then would continue work throughout the day, and gave up his holiday in 1887 on account of pressure of work. He now charged for 566 hours at 1s. 10d. per hour. Mr. Frank Allan, chief inspector of buildings, in the employ of the Leicester Corporation; John Keith, of Manchester, formerly in the borough surveyor's office; John Lofthouse, now in that office; and Frederick Gibbs, of the water works departments, all deposed to having demanded and received extra pay for overtime in times of pressure, while plaintiff deposed that he had been paid for overtime on earlier occasions. For the defence, Mr. Gordon said he gave Mr. Simpson to understand that he would not be paid for overtime, but told him that the increase of salary was intended to cover the extra work. The judge having pointed out that reliance must be placed on the statements of Mr. Gordon, the jury returned a verdict for the corporation, with costs.

The foundation-stone of a new Presbyterian church was laid at Anahilt, near Hillsborough, on Wednesday week. It replaces a smaller fabric built in 1719, and will be Italian in style. It will consist of a parallelogram 70ft. by 45ft. on plan, and will be seated for 620 persons. Messrs. Young and Mackenzie, of Belfast, are the architects, and Mr. Joseph Quinn, of Lisburn, is the builder.

The Birmingham city council received on Tuesday a report from the Free Libraries Committee as to the provision of additional branch libraries, and authorised the committee to acquire lands at Spring Hill, Duddeston and Nechells, and Small Heath as sites for branch libraries, and to obtain designs and estimates and enter into contracts for the erection of three additional branch libraries upon such sites, at an estimated cost of £15,300.

Messrs. Jones and Willis, of Edmund-street, Birmingham, have just executed an order for a pulpit to be presented to Ilkley Parish Church. The work, which is in light oak, is a specimen of fine English carving. The upper part of the pulpit is square in form, with canopies let in the two front corners. Under each canopy is the figure of an apostle, and the subject of the Sermon on the Mount is delicately treated in the centre panel.

At the final meeting of the academic year of King's College, London, Professor G. F. Armstrong, of the Chair of Engineering in the University of Edinburgh, was elected a Fellow of the College, where, in the Engineering Department, he received the earlier portion of his professional training. This is the highest distinction it is in the power of the council of King's College to bestow on former students.

The new Natural History Museum in Vienna will be opened on Sunday next. It is a twin structure to the new Museum of Painting. Both have been erected from designs by Herr Hasenauer, who planned the new Court Theatre, and they stand on either side of the great square wherein the Maria Theresa monument was inaugurated last year. The Natural History Museum will bring under one roof all the public collections formerly scattered among half-a-dozen small museums.

The annual meeting of the Kent Archæological Society was held last week at Dartford. At the business meeting, held under the presidency of Col. Hughes, M.P., Mr. George Payne was elected hon. secretary in succession to Canon Scott Robertson, whose services were recognised on retirement from this office by election as vice-president. Visits were afterwards paid to Dartford, Crayford, and Bexley churches, May Place, Hall Place, and Footscray and Paulscray churches, the day closing with an inspection of Major Heales's collections at Leesons, Chislehurst.

The town council of Dundee have under consideration a proposal to confer the freedom of the city on Mr. William Arrol, who was the contractor for the new Tay Bridge, and is at present erecting the Forth Bridge under Sir John Fowler and Mr. Benjamin Baker.

WATER SUPPLY AND SANITARY MATTERS.

Redditch.—The formal opening of a sewage extension system took place on Wednesday week. The old filter beds, some four acres in extent, had failed on account of their limited area, there being the sewage of a population of 8,000 to dispose of. A new farm at Ipsley, on to which the sewage would flow by gravitation was acquired at a cost of £1,580, and the new works have been carried out at a further cost of £1,000 from plans by, and under the supervision of, Mr. S. E. Thorrold, C.E., surveyor to the local board. The ruling gradient is 1 in 350. The total length of the new sewer is 2½ miles 154 yards. In its course there are 28 distributing chambers, four lamp-holes, two storm overflow chambers, and one manhole. The work has been carried out by Mr. Law, contractor, and there are some 180 acres of land available for irrigation purposes.

CHIPS.

After a service of over forty years, Mr. Harry George Austin, architect and surveyor to the Dean and Chapter of Canterbury, has, the *South Eastern Gazette* mentions, resigned his post, and retires on a pension of £300 per annum. Mr. Austin succeeded his father in the office he has so long held in Nov., 1848, and has from that time until the hour of his retirement had the entire care of the cathedral fabric. The artificial warming of the edifice by means of hot-water pipes was also his work. In addition to his position as architect and surveyor to the Dean and Chapter, Mr. Austin has also held the position of seneschal in the cathedral corporation, which was, however, we believe, a purely honorary post.

The Victoria Jubilee Infirmary at Tynemouth was formally opened on Saturday by Earl Percy. It has been built at a cost of £3,300, from plans by Mr. F. R. N. Haswell, of North Shields.

In the Probate and Divorce Divisional Court on Friday, a *decree nisi* was pronounced in the case of Chambers v. Chambers, in which the wife prayed for dissolution of marriage on account of the desertion and adultery of her husband, William Isaac Chambers, who was described as an architect and surveyor in practice for himself from 1878 to 1884 in Dublin, and since then an architect's assistant in London and in Surrey.

Henry Harding, a builder, residing in Baxter's-place, Edinburgh, appeared in the Edinburgh Sheriff Summary Court on Friday—Sheriff Rutherford on the bench—on a charge of having for three years previous to the date of the presentation of his petition for sequestration failed to keep any books or accounts explaining his transactions, he being a debtor to an amount exceeding £200, and this with intent to defraud. The Sheriff said that if accused could not himself have kept books, he should have employed someone to do so for him; but he was satisfied there was no intention to defraud, and he therefore found the charge not proven.

Mr. Robert Emeric Tyler, F.R.I.B.A., is the architect of the proposed new Panorama to be built on an extensive site in Howick-place, Westminster, near the Army and Navy Stores. It will be constructed of iron, and, like the similar building recently erected in Paris under the direction of Mr. R. J. Gifford Reade, C.E., of Ealing, will be made movable, so that the Panorama may be exhibited in various places after a season in London. The "Battle of Waterloo," by M. Ph. Fleischer, is the first subject to be shown. It is 121ft. in diameter, 50ft. in height, 380ft. in circumference. The cost of the building and the picture is stated to be £34,000.

The meetings of the Somersetshire Archæological Society were held on Tuesday, Wednesday, Thursday, and Friday last. On the latter day about 150 members and friends left Minehead in brakes, and visited the Marsh House and St. George's Church, Dunster, the Castle (the seat of the president of the society, Mr. G. F. Luttrell), and Cleeve Abbey.

Mr. James Mansergh, C.E., who has been selected to go to Melbourne to advise the authorities as to the adoption of a drainage system for that city, is to have a fee of £4,000, and is to spend six weeks in the colony. In addition to the fee the expenses of Mr. Mansergh and his son are to be defrayed.

The memorial-stone of a Children's Gospel Hall now being added to the mission-hall in the High-street, at Wellington, Salop, was laid on Tuesday week. The new building will seat 500 children, and will measure 50ft. by 28ft. Mr. J. L. Randall, of Shrewsbury, is the architect, and Mr. E. Patterson, of Newport, Salop, is the builder.

At a Consistory Court held at St. Nicholas's Church, Liverpool, on Tuesday week, before Vice-Chancellor Espin, a faculty was granted to enlarge St. James's parish church, Haydock, by building an addition to the nave, a new chancel, vestries for the choir and clergy, and an organ chamber. The alterations will cost about £3,500, and the church when completed will hold 580 people.

Our Office Table.

A new charter for the reform of the Royal Scottish Academy has just been laid before the Queen in Council. The charter which it amends was granted in August, 1838, twelve years after the formation of the Academy. The changes are intended to popularise the Academy, and to introduce the improvements in the management suggested by half a century's experience. Powers are taken in it to deal with Academicians who have ceased to reside in Scotland, and who neglect to send work to the Exhibition, so that there may be always in Scotland the full working number of thirty Academicians. An Associateship unlimited in number, instead of confining the rank as at present to twenty, is proposed, and the Associates are very properly now given a voice in the management of the Academy's affairs and the election of members. The charter also deals with the pension fund, and clauses in it give the Academy a freer hand in regard to the disposal of surplus funds. One of the revised rules stipulates for the number of works sent in by Academicians and Associates being reduced from seven to five, and a relaxation is made in regard to the frames of pictures, which need not be gilded. We have referred to the Charter as it affects Scottish architects on p. 173 *ante*.

The death is announced of Baron de Witte, the distinguished Belgian archæologist and numismatist. He was in his 82nd year, having been born at Antwerp in 1808. He was a member of the Belgian Royal Academy from 1851, was elected correspondent of the French Academy of Inscriptions and Belles Lettres in 1842, and one of the eight foreign associates of that academy in 1864. He was also a member of many other academies and learned societies, and was decorated with several important orders. Baron de Witte was the author of a number of learned works, catalogues, and translations. With Chevalier Lenormant he published the first three volumes of the "Elite des Monuments Céramographiques," and was the sole author of the fourth volume. In 1869 he issued, in four volumes, his "Researches upon the Emperors who reigned in Gaul to the third century of the Christian Era"; and the following year his French translation of Mommsen's "Histoire de la Monnaie Romaine" appeared. From 1830 he has been a constant contributor to the leading European journals dealing with archæology and numismatics.

Two men recently met their death and several were injured by sewer-gas while repairing a sewer under Corporation-square, Belfast. The City Council requested Professor Letts, of the Queen's College, to investigate the matter, and report as to what measures should be taken to prevent a recurrence of the catastrophe. Dr. Letts gives grounds for his belief that the men were prostrated by a sudden outburst of foul gas, which he found, on careful examination, entered the sewer from a disused and long-forgotten privy pipe broken into; but some of them died, and others were injured, not from gas poisoning, but from submersion in sewage water and its effect on their lungs. The sewer was well ventilated, and none of the men would have been seriously injured but for the irregular dips in the sewer and the consequent accumulation of sewage at this point. He recommended the immediate reconstruction of the sewer beneath Corporation-square, the prohibition of cleaning in dry summer weather, and in exceptionally hot weather no men should enter a sewer. Before cleaning it two men, each provided with a lamp, should walk through first and report on its condition, and while at work the men should be compelled to have at least two lamps alight in each section to prevent panic should one be dropped or extinguished. They should also be directed to search for openings in sewers, and to report immediately when any sewer is in a bad condition, either as regards depth of water, foulness of air, or defects in brickwork. Dr. Letts's recommendations have, on the advice of the improvement committee, been adopted by the Belfast Corporation, and are worthy of wider study by borough officials and members of councils.

The sanitary authority of Oundle have adopted a scheme for a new water supply prepared by Mr. W. H. Radford, of Nottingham. The estimated outlay is £3,700.

MEETING FOR THE ENSUING WEEK.

Monday.—Clerks of Works' Association. "Turkish Baths," by W. Horne, Carpenters' Hall. 8 p.m.

CHIPS.

It is announced that since the system of Registration for Plumbers was established three years ago no less than 4,000 plumbers have been registered under the auspices of the court of the Plumbers' Company.

A Select Committee of the House of Commons has passed the Bill granting an extension of time for four years within which to complete the Tower Bridge.

The foundation stones of a new Liberal hall at Tarvin, Cheshire, were laid July 29th. The architect is Mr. John Wynne, F.R.I.B.A., of Manchester.

Mr. Charles Reboul Sacré, who was for 27 years the chief engineer of the Manchester, Sheffield, and Lincolnshire Railway Company, committed suicide by shooting himself on Saturday morning at his residence at Manchester. Since his retirement from active work three years ago Mr. Sacré had served as consulting engineer to the company with which he had been so long connected.

The new board schools recently erected near St. Paul's Church, Barry, South Wales, were formally opened on Monday morning. The buildings occupy about an acre of ground, and are divided into one large room 75ft. by 20ft., two class-rooms 25ft. by 20ft., two lavatories 20ft. by 16ft., an infants' large room 50ft. by 20ft., and a class-room 20ft. square. The total cost, including site, is £5,500. The contractor was Mr. W. Crisp, of Cadoxton and Barry, and the architects were Messrs. Seward and Thomas, of Cardiff.

Mr. J. W. Start, of Cups Chambers, Colchester, was on Monday last elected by the ratepayers as surveyor to the Colchester Channel Commissioners by a majority of 64 votes. There were five other candidates, and 115 voters went to the poll.

We are glad to learn that the Fire Brigade Committee of the London County Council has decided at once to augment the brigade by 138 firemen, and to add four new stations, with the usual complement of steamers and manuals, 50 fire-escapes and watch boxes, and 50 hose carts, to the plant of the Brigade. It has also been decided to increase the number of electrical alarms by 200, bringing up the total number to over 600.

Plans by Mr. E. M. Bruce Vaughan, of Cardiff, have been adopted for a church to seat 600 persons, proposed to be commenced forthwith at Morristown, near Swansea.

The new waterworks for the borough of Ayr have been formally handed over to the town council by Mr. Wilson, engineer. The entire cost is about £50,000, and the supply of water is equal to 2½ millon gallons per day.

A new Congregational church is to be built at the corner of Third Avenue, Queen's Park, Harrow-road, adjoining an existing mission hall. Mr. Rowland Plumbe is the architect.

The Westgate Almshouses at Warwick were opened on Tuesday. They have been rebuilt on the site of older almshouses, which had become dilapidated, and are Elizabethan in style, harmonising with Leicester Hospital, near which they stand. Mr. F. H. Moore was the architect.

The foundation-stone of a new Wesleyan chapel was laid at Bradley, near Darlaston, Staffs, on Wednesday week. It will replace a smaller edifice built in 1835. Messrs. Joynson, of Darlaston, are the architects, and Mr. J. Malin, of West Bromwich, is the builder.

Mr. G. A. Pryce Cuxson, quantity surveyor, of 9, Victoria Chambers, Westminster, has taken into partnership Mr. Wm. G. Leigh (who for the last twenty years has been with Messrs. Karslake and Mortimer). The business will be in future carried on under the style or firm of Pryce Cuxson and Leigh.

A new church at Broughton, near Wrexham, was opened on Monday by the Bishop of St. Asaph. The church, which is built in the centre of a large mining district, will seat 340, and has cost £2,152. The church is built of stone from the Westminster and Caraig Wen Quarries.

Zion Congregational Chapel, Stretford-road, Manchester, has just been reopened (July 14) after structural alterations, new orchestra, ventilating, and beautifying. Mr. John Wynne, F.R.I.B.A., is the architect.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

Abbey Wood, Kent.—For removing an iron school building from Hornsey-road and re-erecting it on Knee Hill, Abbey Wood, for the London School Board:—

Williams, G. S. S., and Son	£212 0 0
North, T., and Son	200 0 0
Pitchford, G.	183 0 0
Martin, A.	170 0 0
Kirby and Chase	163 0 0
Cruwys, T., Caroline-street, Camden Town (accepted)	155 0 0

Belfast.—For second section of main drainage. Mr. J. C. Brettand, city engineer:—

Martin, H. and J. (accepted) ...	£27,011 0 0

Bermondsey, S.E.—For the supply of 1,700 tons of granite:—

	Per ton.
Carey and Sons	11s. 7d.
Turner and Sons (accepted)	11 0

Bristol.—For laying out Stapleton Park and the erection of boundary wall, for the city corporation:—

Clarke, E., Bristol (accepted) ...	£857 0 0

(Originally accepted at £100 less, when an error was discovered by contractor. The tender is still under borough surveyor's estimate, and the lowest by £154 of those sent in.)

Brixton, S.W.—For the construction of a sewer in Water-lane, for the Lambeth vestry:—

Bell, E....	£3,140 0 0
Mayo	2,750 0 0
Wood and Co.*	1,883 0 0

* Withdrawn on account of error of omission of £1,000. [The surveyor's estimate being £1,500, the work is to be carried out by the vestry's workmen].

Bromley, Kent.—For residence, for Mr. R. M. C. James, on Sundridge-avenue. Mr. F. Rogers, architect:—

Payne, D., Bromley	£2,663 0 0
Maides and Harper, Croydon ...	2,537 0 0
Bowyer, J. and C., Norwood ...	2,341 0 0
Crossley, E., Bromley	2,326 0 0
Lay, G. H., Bromley	2,199 0 0

Bursley.—For the construction of a refuse destructor, for the town council:—
Manlove, Alliott, and Co., Nottingham (accepted).

CAMBORNE.—For the erection of a wall in front of the mortuary chapel, for the burial board:—

Carkeek, A., Redruth (accepted) ...	£138 17 0
Bellman, J., Camborne	105 11 4
Turner, W. H., Trehidy-road, Camborne (accepted)	95 10 0

CARDIFF.—For the erection of cowhouses at Erw'r Delyn, near Penarth, for Mr. J. R. Thompson. Messrs. Richards and Gethin, architects:—

Griffiths, G., Cardiff	£227 0 0
Price, R., Cardiff (accepted)... ...	210 0 0

CARDIFF.—For making Lombard and Regents-streets, Barry Docks, for the Holton-Barry Syndicate. Messrs. Richards and Gethin, surveyors. Quantities by surveyors:—

Crisp, W., Barry	£570 0 0
Love, D.	489 3 9
Barstow, J.	361 11 4
Adamson, W.	440 0 0
Ince, E. J.	399 0 0
Brock, J. (accepted)	300 0 0

Rest of Cadoxton.

CARDIFF.—For fittings to H.M. Customs, for the Barry, Dock and Railways Co. Messrs. Richards and Gethin architects:—

Price, R., Cardiff (accepted).

CARDIFF.—For the erection of offices at Barry Docks, for Messrs. D. A. Thomas, M.P., Riches and Co. Messrs. Richards and Gethin, architects:—

Shepherd and Son Cardiff	£261 10 0
Price, R., Cardiff (accepted)... ...	247 0 0

CARDIFF.—For the erection of stable, Penarth, for Major Thornley. Messrs. Richards and Gethin, architects:—

Bevan, T., Penarth	£185 0 0
Jones Bros.	181 0 0
Price, R.	176 0 0
Griffiths, T., Penarth	168 0 0
Jones, J., Penarth	150 0 0
Shepherd and Sons	124 10 0
Griffiths, G.	135 5 0
Shepton and Sons	125 0 0
Tape, M., Penarth (accepted) ...	94 0 0

Rest of Cardiff.

CARDIFF.—For fittings to National Provincial Bank of England, Barry. Messrs. Richards and Gethin, architects:—

Shepton and Sons, Cardiff (accepted).

CARDIFF.—For fittings to petty offices, Barry, for th Barry Dock and Railways Co. Messrs. Richards and Gethin, architects:—

Price, R., Cardiff (accepted).

CARDIFF.—For making Newland-street, Barry Docks, on the Wenvai Castle estate. Messrs. Richards and Gethin, surveyors:—

Line, D., Cadoxton (accepted) £230.

CARDIFF.—For the erection of summer residence at Barry on the Romilly Estate, for Capt. Murrell. Messrs. Richards and Gethin, architects. Quantities by architects:—

Jones Bros.	£1,300 0 0
Davies, D.	1,292 0 0
Shepherd and Sons	1,232 0 0
Davies, D. J....	1,210 0 0
Allen, J.	1,121 6 0
Bowers, W., and Co., Hereford ...	1,056 6 0
Crisp, W., Barry (accepted) ...	1,025 0 0

Rest of Cardiff.

CARDIFF.—For the erection of public offices, Barry, for the Barry Dock and Railway Co. Messrs. Richards and Gethin, architects. Quantities by architects:—

Allen, J.	£2,643 18 4
Shepherd, C., and Sons	2,619 0 0
Davies, D. J....	2,495 0 0
Davies, D.	2,365 0 0
Jones, J., Penarth	2,315 0 0
Price, R.	2,275 0 0
Bowers, W., and Co., Hereford ...	2,205 0 0
Ince, E. J., Codoxton	2,165 0 0
Jones Bros. (accepted)	2,112 0 0

Rest of Cardiff.

CLERKENWELL.—For the construction of a viaduct, carriage-way, footways, sewers, &c., between Clerkenwell-road and Farringdon-road (to form part of the new street between Holborn and Islington), for the London County Council:—

Gibson, T., and Co., Westminster Chambers	£33,883 15 4
Neave, J. W. and J., Leytonstone	27,586 0 0
Culverhouse, F. H., and Co., Camden Town	27,075 8 6
Killingback, C., Camden Town...	26,480 0 0
Nowell and Robson, Kensington	26,300 0 0
Double, G., Ipswich	25,851 15 4
Mowlem, J., & Co., Westminster	25,287 0 0
Brass and Son, St. Luke's ...	24,776 0 0
Holme and King, Euston-road ...	24,475 0 0
Docwra, T., and Son, Ball's Pond	23,436 0 0
Biggs, J., Birmingham and Stoke Newington	23,386 0 0
Griffiths, W., Kingsland-road ...	22,690 0 0
Adams, T., Kingsland	22,306 17 0
Townsend, J. D., St. Alban's ...	21,395 15 0

COWES.—For the erection of a Methodist Free Church:

Hayles	£2,595 0 0
Bull and Son (accepted)	1,998 0 0

DARTFORD, KENT.—For memorial hall, for the Dartford Young Men's Bible Class. Mr. G. H. Tait, M.Inst.C.E., engineer and architect:—

	A.	B.	Total.
Knight, T., Sidcup	£810	£700	£1,510
Mutton and Wallis, Gravesend* ...	675	725	1,400
Lucia, J., Crayford ...	621	771	1,392

* Accepted for B contract.

DARTFORD, KENT.—For repairs to the Bull Hotel, for Mr. G. Startup. Mr. G. H. Tait, M.Inst.C.E., surveyor:

Knight, T., Sidcup	£359 0 0
Hill, G., Gravesend (accepted) ...	351 14 0

DULWICH, S.E.—For the erection of lodges in Dulwich Park, for the London County Council:—

Bugh	£6,517 0 0
Barnes	6,280 0 0
Holliday	5,900 0 0
Fotheringham	5,855 0 0
Brass and Son	5,673 0 0
Barter	5,805 0 0
Sparling	4,300 0 0
Garnier	3,950 0 0
Landford	3,356 0 0

FREEMANTLE, SOUTHAMPTON.—For carrying out works of sewerage for the Freemantle Local Board. Mr. H. J. Weston, surveyor and engineer to the board:—

Bottoms, L., London	£21,750 0 0
Gibson, W., Exeter	17,550 0 0
Slade, C. J., Maidstone	16,700 0 0
Mackay, J., Hereford	14,645 1 11
Neave, J. W. and J., Leytonstone	13,689 0 0
Morgan, Isted, & Morgan, Southampton	13,487 0 0
Whettam, J. T., Weymouth ...	13,400 0 0
Light, R. and C., Portsmouth ...	13,298 0 0
Pickthall, J., and Sons, Merthyr Tydvil	12,941 0 0
Ossenton, G., Westerham ...	12,882 0 0
Perkins, E. G., Lymington ...	12,733 9 9
Cunliffe, W., Dorking	12,223 0 0
Hall, T. P., Southsea	12,008 0 0
Dickson, J., St. Alban's	12,000 7 2
Roe, J. and W., and Co., Southampton	11,700 0 0
Sanders, H. I., Northam, Southampton (accepted)	10,980 0 0

Surveyor's estimate, £11,750.

GLOUCESTER.—For erecting additional offices for Messrs. J. Weston and Co., the Docks, Gloucester. Mr. J. F. Trew, M.S.A., Station-road, Gloucester, architect and civil engineer:—

Wingate and Sons	£199 10 0
Cullis, F.	198 0 0
Jones, D. C., and Co.	197 0 0
Clutterbuck, E....	182 5 0
Freeman and Jones	175 0 0
Williams, W. (accepted)	174 0 0

All of Gloucester.

GLOUCESTER.—For erecting pair of semi-detached villas at Barley-close, Gloster. Mr. J. F. Trew, Gloucester, architect and civil engineer:—

Fream, W.	£1,438 0 0
Jones, D. C., and Co.	1,366 0 0
Freeman and Jones*	1,300 0 0

* Accepted subject to certain deductions.

GLOUCESTER.—For erecting new lecture hall, class-rooms, and offices, at Southgate Congregational Church, Gloucester. Mr. J. F. Trew, M.S.A., Gloucester, architect and civil engineer:—

Freeman and Jones	£1,385 0 0
Jones, D. C., and Co. (accepted)...	1,283 0 0
For heating apparatus for the above:—	
Haden and Son, Trowbridge ...	129 8 0
For heating apparatus for the church and lobbies:—	
Haden and Son	133 0 0

GLOUCESTER.—For erecting walls of workshops, offices, boiler house, and chimney stacks, for new works, for Messrs. Summers, engineers, Gloucester:—

Bricklayer.—Contract No. 1:—£990.
Ironwork by Messrs. Summers.

GREAT YARMOUTH.—For new schools, alterations, &c., for the Great Yarmouth School Board. Messrs. Bottle and Olley, architects:—

New girls' school, Stradbroke-road Schools, and alterations to boys' and infants' schools:—

Cooper, J. S.	£2,319 16 0
Leggett, J.	2,315 10 0
Eastoe, R.	2,305 17 2
Hawes, J. H.	2,278 2 0
Rand and Cooper	2,275 0 0
Grimble and Watts...	2,270 0 0
Fuller, C. J.	2,270 0 0
Cork and Beech	2,260 0 0
Leggett, T. G. (accepted)... ...	2,240 6 0

Architects' estimate, £2,260.

Alterations and additions to Cobholm Island Board Schools—infants' department:—

Hawes, J. H.	£817 18 0
Cooper, J. S.	780 10 0
Leggett, J.	778 10 0
Grimble and Watts	772 10 0
Rand and Cooper	765 0 0
Eastoe, R.	760 8 0
Cork and Beech...	747 10 0
Beckett, G.	726 0 0
Batchelor J.	718 0 0
Harman, J. (accepted)	685 0 0

Architects' estimate, £800.

Additions to St. George's Board Schools—infants' department:—

Barnard, M.	£416 0 0
Hawes, J. H.	365 5 0
Harman, J.	316 16 0
Cooper, J. S.	297 0 0
Grimble and Watts	282 0 0
Leggett, J.	275 0 0
Eastoe, R.	272 6 0
Rand and Cooper	272 5 0
Cork and Beech (accepted)	263 0 0

Architects' estimate, £280.

For new sliding partitions, St. George's Board Schools:—

Cooper, J. S.	£73 14 6
Hawes, J. H.	65 10 0
Cork and Beech (accepted)	61 15 0
Durrant, C.	42 9 0
For gas-fittings to Northgate School extension:—	
Barge and Freeman	£16 17 6
Rainer	12 10 0
Gray and Palmer	9 18 0
Mason	9 13 2
Atkins (accepted)	8 18 6

GRIMSBY DOCKS.—For building new engine-room, for the Co-operative Ice Co. Mr. E. W. Farebrother, F.R.I.B.A., Grimsby, architect:—

Riggall, W. (accepted).
(Lowest of six tenders.)

GRIMSBY DOCKS.—For building new offices and stores, for the North-Eastern Steam Fishing Co. Mr. E. W. Farebrother, F.R.I.B.A., Grimsby, architect:—

Roebuck and Gooseman (accepted).

GRIMSBY.—For alterations and additions to the South Parade board schools, for the Grimsby school board. Mr. E. W. Farebrother, F.R.I.B.A., Grimsby, architect:—

White, J.	£1,098 13 0
Thompson, J. M., & Sons, Louth ..	1,049 0 0
Porkess, U.	988 12 0
Guy, J....	980 10 0
Marrows, H.	940 0 0
Siminson, T.	927 7 2
Chapman, J.	925 10 0
Grant, F., Cleethorpe (accepted) ...	873 13 0

Rest of Grimsby.

GULVAL, CORNWALL.—For supplying and fixing a peal of six bells in the tower of the parish church, as a memorial to the Rev. W. W. Wingfield's fifty years' incumbency:—

Warner, J., and Son, London (accepted) £426.

HEALING.—For building new wing and general restoration of Healing Manor, North Lincolnshire. Mr. E. W. Farebrother, F.R.I.B.A., Grimsby, architect:—

Accepted tenders:—
Bricklayer:—Guy, J.
Joiner:—Roebuck and Gooseman.
Stonemason:—Frith, F.
Plumber:—Boocock, T.

IPSWICH.—For erection of residence at Ipswich, for Mr. W. Booth. Messrs. J. S. Corder and F. Brown, 9, Thorofare, Ipswich, joint-architects:—

Catchpole	£1,450 0 0
Bennett	1,410 0 0
Girling	1,375 0 0
Grimwood (accepted)	1,370 0 0

IPSWICH.—For alterations to Great White Horse Hotel, for Mr. M. P. Clark. Mr. J. S. Corder, 9, Thorofare, Ipswich, architect:—

Bennett	£127 0 0
Grayston	125 0 0
Coe (accepted)	120 0 0

ISLINGTON.—For providing and fixing a plain slate public urinal at Sermon-lane, near Liverpool-road, for the Vestry of St. Mary, Islington. Mr. C. Higgins, surveyor:—

Doulton and Co.	£115 0 0
Finch, B., and Co.	89 0 0
Jennings, G. (accepted)	79 0 0

KENSINGTON.—For the erection of stabling, coach-house, &c., for Mr. F. Bailey, Addison-road, Kensington, W. Mr. F. Le Rossignol, F.S.I., 1, Gresham-buildings, Basinghall-street, E.C., architect and surveyor:—

Lascelles, W. H., and Co.	£986 0 0
Gentry, M.	890 0 0
Kirk and Randall	889 0 0
Lawrance, E., and Sons	870 0 0
Staines and Sons	838 0 0
Langham, J., Holloway (accepted)...	798 0 0

LECHLADE, GLOUCESTERSHIRE.—For alterations and additions to the Swan p.h., for Mr. R. B. Bowly. Mr. R. J. Beswick, Fleet-street, Swindon, architect:—

Barrett, T.	£503 0 0
Williams, J.	490 0 0
Wiltshire, S. (accepted)	480 0 0

All of Swindon.

* LEEDS.—For erecting a four-dial illuminated turret clock on the Richmond Hill Board School, for the school board:—

Potts, W., and Sons, Leeds (accepted) £189 12 9

LLANSAINTFFRAID, NEAR OSWESTRY.—For alterations and additions to the vicarage house, &c, Llansaintffraid, Oswestry, for the Rev. T. H. Lloyd. Mr. E. Jones, M.S.A., 12, Temple-row, Wrexham, architect:—

(Seven tenders received.)

LONDON, N.—For decorative repairs to No. 15, Pemberton-road, Holloway, N. Mr. E. J. Harrison, 72, Chancery-lane, W.C., architect:—

Fernley, J. H. (accepted)	£145 0 0

LONDON, N.—For painting and reinstating thirteen houses at Adelaide-square, Shepperton-road, Islington, N. Mr. E. J. Harrison, 72, Chancery-lane, W.C., architect:—

Stevens Bros., Holloway	£695 0 0
Dearing, C., and Son	680 0 0
Styles, W., Islington	655 0 0
Stephens, H. S., Islington*	586 10 0

*Accepted.

LONDON.—For alterations to the Queen's Head p.h., Little Pulteney-street, W., for Mr. G. A. Young. Mr. T. H. Smith, 17 and 18, Basinghall-street, E.C., architect:

Hewlitt, C. F.	£590 0 0
Allen and Sons...	584 0 0
Turtle and Appleton	465 0 0
Smith, W. H.	459 0 0
Hammond, A. W. (accepted) ...	417 0 0
For counter and pewterer's work:—	
Sanders and Son	80 0 0
Buckley and Beach (accepted) ...	65 0 0
For gas-fittings:—	
Davis, C. J.	78 15 0
Vaughan and Brown	70 10 0
Buckley and Beach	62 5 0

LONDON.—For sanitary repairs, &c., at the Infirmary, Princes-street, Old Gravel-lane, E., for the guardians of the poor of the parish of St. George-in-the-East. Messrs. Wilson, Son, and Aldwinckle, 2, East India-avenue, Leadenhall-street, E.C., architects:—

Holliday	£1,375 0 0
Staines and Son	1,087 0 0
Holland, J. (accepted)	1,079 0 0

LONDON.—For alterations and decorations to Nos. 5 and 7, Southampton-row, W.C., for Mr. J. Branner. Messrs. Tinker and Morewood, 4, New Inn Chambers, Wych-street, Strand, W.C., architects and surveyors:—

	A.	B.
Heath, Brompton	£310	£60
Jones, J., Chelsea	269	72
Banks, Bloomsbury...	197	54

A.—Alterations. B.—Decorations.

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And 110, BOTHWELL STREET, GLASGOW.

London, E.—For the erection of a new branch bank at No. 91, Mile End-road, for the Central Bank of London, Ltd. Messrs. Hammack and Lambert, 59, Bishopsgate-street Within, E.C., architects:—

Higgs and Hill	£5,240	0	0
Boyce, T.	4,896	0	0
Cox, C.	4,838	0	0
Wood, F. and F. C.	4,800	0	0
Drew and Cadman	4,760	0	0
Brass, W., and Son	4,653	0	0
Holloway Bros.	4,483	0	0
Hearle, T., and Son (accepted)	4,289	0	0

London.—For alterations and additions to Nos. 106 and 108, Regent-street, W., for the London Stereoscopic and Photographic Company, Ltd. Mr. R. B. Marsh, architect, Mr. D. Campbell and Son, surveyors:—

Peto Bros.	£4,287	0	0
Mowlem and Co.	4,247	0	0
Greenwood, J. and J.	3,986	0	0
Ashby and Horner	3,893	0	0
Lawrance and Sons	3,879	0	0
Nightingale, B. E. (accepted)	3,846	0	0

London.—For carrying out works at various schools, for the London School Board:—

Kilburn-lane.—Providing a new boiler:—

Cannon, W. G.	£275	0	0
Kinnell, C. P., and Co.	215	0	0
Hayward Bros. and Eckstein	187	0	0
Fraser and Fraser (accepted)	172	10	0

Globe-terrace, Hackney.—Extending heating apparatus:

Cannon, W. G.	£148	0	0
May, J. and F.	135	0	0
Hayward Bros. and Eckstein	99	0	0
Price-Lea, H. C., and Co. (accepted)	89	0	0

New-road, Wandsworth-road.—Altering forecourt:—

Cruwys, T.	£35	0	0
Davis Bros.	33	10	0
Mallett, H. (accepted)	13	10	0

Waldron-road, Tooting.—Repairing block flooring in girls' hall:—

Davis Bros.	£232	0	0
Lorden, W. H., and Son	110	0	0
Mallett, H.	72	0	0
Robinson, W., Tooting (accepted)	45	0	0

London, S.W.—For alterations of council chamber and offices at Spring-gardens, for the London County Council. Mr. T. Blashill, architect:—

Brass and Son	£8,970	0	0
Mowlem, J., and Co.	8,782	0	0
Garlick and Horton, Ltd.	8,350	0	0
Kirk and Randall	8,216	0	0
McCormick, G., and Sons	7,833	0	0
Stimpson and Co.	7,460	0	0
Elkington, T.	7,350	0	0
Charteris, D.	7,324	0	0
Greenwood, J. and J.	7,091	0	0
Allen, J., and Son (accepted)	6,600	0	0

London, E.C.—For paving with compressed asphalte footways of Holborn Viaduct, Newgate-street, Queen Victoria-street, Threadneedle-street, and New Bridge-street, and the roadways of George-street, and Mansion House-place, for the City Commissioners of Sewers. Mr. W. Haywood, engineer:—

Limmer Compressed Asphalte Paving Co. (accepted).

Norwood, S.E.—For the supply of school furniture at the Norwood schools, for the Lambeth Guardians:—

Court	£69	0	0
Deacon and Co.	68	0	0
Aldridge and Co. (accepted)	67	10	0

Old Ford.—For the erection of five dwelling-houses and shops in the Roman-road, North Bow, for Messrs. Freand and Co. (they providing part material). Mr. C. E. Jackson, M.S.A., 185, Grove-road, E., architect:—

North Bros.	£3,260	0	0
Beale, G. W.	2,663	10	0
Boulter and Lea	2,548	0	0
Coulsell Bros.	2,547	0	0
Everard, C., Lucas Works, Lucas-road, Abbey-lane, Stratford*	2,099	0	0

* Accepted.

Plymouth.—For alterations at No. 60, George-street, for Mr. Maton. Mr. W. J. Musgrove, architect:—

Debnam, A. R.	£358	0	0
Reed, J.	299	0	0
Palk, W.	267	0	0
Ham, J.	264	10	0
Lethbridge, A. R., and Son*	259	0	0

* Accepted.
All of Plymouth.

Rhinefield.—For completing the carcase, and partially finishing a mansion (exclusive of stable court), at Rhinefield, near Brockenhurst, Hampshire, for Lieut. Munro, R.N. Messrs. Romaine Walker and Tanner, architects. Quantities supplied by Messrs. Pryce Cuxson and Leigh, surveyors:—

Dove Bros.	£20,526	0	0
Lawrance, E., and Sons	20,475	0	0
Holland and Hannen	20,314	0	0
Trollope and Sons	20,120	0	0
Hall, Beddall, and Co.	19,977	0	0
Chappell, J. T.	19,615	0	0
Abley, E.	19,300	0	0
Lovatt, H.	19,300	0	0
Shillitoe and Son	19,275	0	0
Ward, Clarke, and Co.	19,238	0	0
Holloway Bros.	18,513	0	0
McWilliam, J., & Son (accepted)	18,390	0	0

Sevenoaks, Kent.—For the erection of a pair of semi-detached residences in Vine Court-road, for Mr. J. H. Marchant. Mr. J. W. Brooker, 13, Railway-approach, London Bridge, S.E., architect:—

Wiltshire	£2,150	0	0
Garratt and Son	1,610	0	0
Kick, G. J. (accepted)	1,583	0	0

Southwark.—For station at Great Dover-street, S.E., for the City of London and Southwark Subway Co., being one of six. Mr. T. P. Figgis, A.R.I.B.A., architect. Quantities by Mr. R. C. Gleed:—

Brickell	£1,864	0	0
Wall Bros.	1,854	0	0
Holliday and Greenwood	1,778	0	0
Downs, W.	1,773	0	0
Greenwood, J. and J.	1,728	0	0
Lawrance and Sons	1,697	0	0
Simpson and Son	1,679	0	0

St. Mary Cray.—For additions and alterations to premises at St. Mary Cray, Kent, for the Crays Co-operative Society, Ltd. Mr. St. Pierre Harris, 1, Basinghall-street, E.C., and Orpington, architect:—

Otway	£1,063	0	0
Hart Bros.	1,035	0	0
Wood	997	0	0
Knight	858	0	0
Lowe (accepted)	799	0	0
Taylor, W. B. (withdrawn)	677	0	0

Stockport.—For the erection of semi-detached houses in Lowfield-road, for Messrs. A. Clithero and C. Shore. Mr. C. R. Locke, St. Peter's-square, Stockport, architect:

Brown Bros.	£700	0	0
Eadie, D.	655	0	0
Gaukroger, W. D., Stockport*	647	10	0

* Accepted.

Stockport.—For alterations and additions to Lancashire Hill Stores, for the Stockport Industrial and Equitable Co-operative Society, Ltd. Mr. C. R. Locke, St. Peter's-square, Stockport, architect. Quantities by architect:—

Morton, T., Heaton Norris (accepted) £110 0 0

Stockport.—For the erection of new shop premises and eight cottages at Cheadle Heath, for the Stockport Industrial and Equitable Co-operative Society, Ltd. Mr. C. R. Locke, St. Peter's-square, Stockport, architect. Quantities by the architect:—

Byers, G., Stockport (accepted) £1,693 10 0

Stockport.—For the erection of a new bakery in Chestergate, for the Stockport Industrial and Equitable Co-operative Society, Ltd. Mr. C. R. Locke, St. Peter's-square, Stockport, architect. Quantities by architect:—

Clarkson, C., Stockport (accepted) £595 0 0

Stockton-on-Tees.—For erecting St. Peter's church schools, Stockton-on-Tees. Mr. E. E. Clephan, architect. Quantities by architect:—

Cook, J.	£2,196	0	0
Atkinson, W. C.	2,146	2	5
Craggs and Benson	2,113	10	0
Davison, J.	2,000	0	0
Perks, J.	1,940	0	0

Stone, Staffs.—For the construction of a reservoir in connection with the water supply, for the local board:—

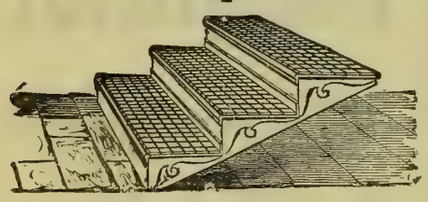
Mackay (accepted) about £2,000 0 0

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Batley
Bedminster
Bescot Junction
Birmingham
Bishopsgate
Blackfriars
Blackfriars Bridge
Blake Street, Sutton Coldfield
Blaydon-on-Tyne
Bletchley
Bolton
Bolts Bridge
Bombay, India
Bow
Bowdon Central
Brick Lane
Bristol
Broadfield
Broad Street
Broadstone, Dublin
Burdett Road
Burscough Junction
Burton
Bury
Borough Road, Mersey Tunnel
Canonbury
Camden Road
Chalk Farm
Charing Cross
Cheddington
Cheetham Hill Junction
Chequerbent
Clayton
Clifton
Clitheroe
Crewe
Crooked Billet Level Crossing
Cross Lane
Crumpsall
Cullercoates
Cannon Street
Dalston
Daubhill
Daybrook
Denholme
Derby
Droylesden
Drighlington
Dudley
Dudley Port
Dundee
Ealing Common
Ealing Terminus
Earl's Court
Edgware Road
Failsworth
Farringdon Street
Farrington
Fenchurch Street
Finchley Road
Firsby
Forest Gate
Forest Road Level Crossing
Fulham
Geedley
Gloucester Road
Gower Street
Grantham
Greenwich
Hackney
Haggerston
Hammersmith
Heaton Park
Hereford, Barr's Court
Highbury
Highdran Road, Wallsend
Hollinwood
Holyhead
Homerton
Horley
Hounslow
Hounslow Barracks
Keighley
Kemble Junction
Kenilworth
Kensal Green
Kentish Town
Kilburn
Kilsby
King's Cross
King William Street
Langley Green
Latimer Road
Lea Bridge
Leamington
Leman Street
Leyland
Leyton
Leytonstone
Lichfield
Limehouse
Lincoln
Little Ealing
Liverpool Road, Manchester
Liverpool Street
Llandudno
Long Buckby
Loudoun Road
Ludgate Hill
Mark Lane
Maidstone
Manchester
Manchester, Exchange
Manchester Road
Mansion House
Mildmay Park
Millhill
Milverton
Monkwearmouth
Moorgate Street
Monument
Newcastle-under-Lyme
New Cross
Newport
Newton Heath
North Brentford
North Bridge
Northampton (Castle Station)
Nottingham
Oldbury
Old Ford
Oldham (Mumps)
Paddington
Parsons Green
Patricroft
Penzance
Pickle Bridge
Plaistow
Pleck
Plymouth
Poplar
Portsmouth
Prestwich
Radcliffe Roade
Salisbury Road
Seething Lane
Shadwell
Sheffield
Shoreditch
Sloane Square
Snow Hill, Birmingham
Slough
Soho
South Bromley
South Kensington
Southport
Speke
Spring Grove
Stechford
Stepney
Stoke
Stourbridge
Stratford
Stretford
Sudbury
Sunderland
Sutton
Sutton Coldfield
Temple
Thornton
Torquay
Tower of London
Tring
Tynemouth
Upton Park
Victoria
Victoria Park
Walham Green
Wallsend
Walsall
Waterloo, Liverpool
Weaste
Werneth, Oldham
Westbourne Park
West End Lane
Westminster
Whitchurch
Whitechapel
Whitefield
Whitley
Widnes
Willenhall
Bridge
Willesden
Wood Green
Wormwood Scrubbs
Worsley
Wolverhampton
Wolverton

Barracks.

Aldershot
Ashton-under-Lyne
Barnet
Belfast
Budbrook
Burnley
Caterham
Chatham
Chester
Coventry
Curragh Camp
Dublin, Beggar's Bush
Dublin, Island Bridge
Dublin, Ship Street
Dublin Royal Barracks
Dundalk
Dublin Castle Police Barracks
Eastney
Fleetwood
Fulwood
Halifax
Hamilton, Glasgow
Hulme
Knightsbridge
Leicester, Glen Parva
Manchester
Newbridge
Newcastle-on-Tyne
Normanton
Northampton
Norwich
Portsea
Portsmouth
Preston
Regent's Park
Salford
Shorncliffe
Trim
Warley
Winchester
Woolwich
Wrexham

Schools, &c.

Belfast Methodist College
Battersea, St. Mary's Church
Birmingham, Cowper Street
Clapham
Colchester
Forest Gate
Hanway Place
Harrow
Haverstock Hill Orphan Working School
Jamaica Level
Leyton, Grammar School
Leyton, Church Road
Newhaven
North Bow
Old Ford
Poplar, Byron & Bright Streets
Southsea, Church Path
Southsea, Omega Street
Stratford, Colgrave Road
Stratford, Salway Place
Sutton
St. Jude's
Tayport
Torrington
Upton Cross
Wandsworth

Hospitals.

Belfast County Lunatic Asylum
Greenwich Infirmary
Guy's Hospital
Lincolnshire County Asylum
Middlesex County Lunatic Asylum
Netley Hospital
Peterborough Infirmary
Rubery Asylum
Northfield
St. Thomas's Hospital

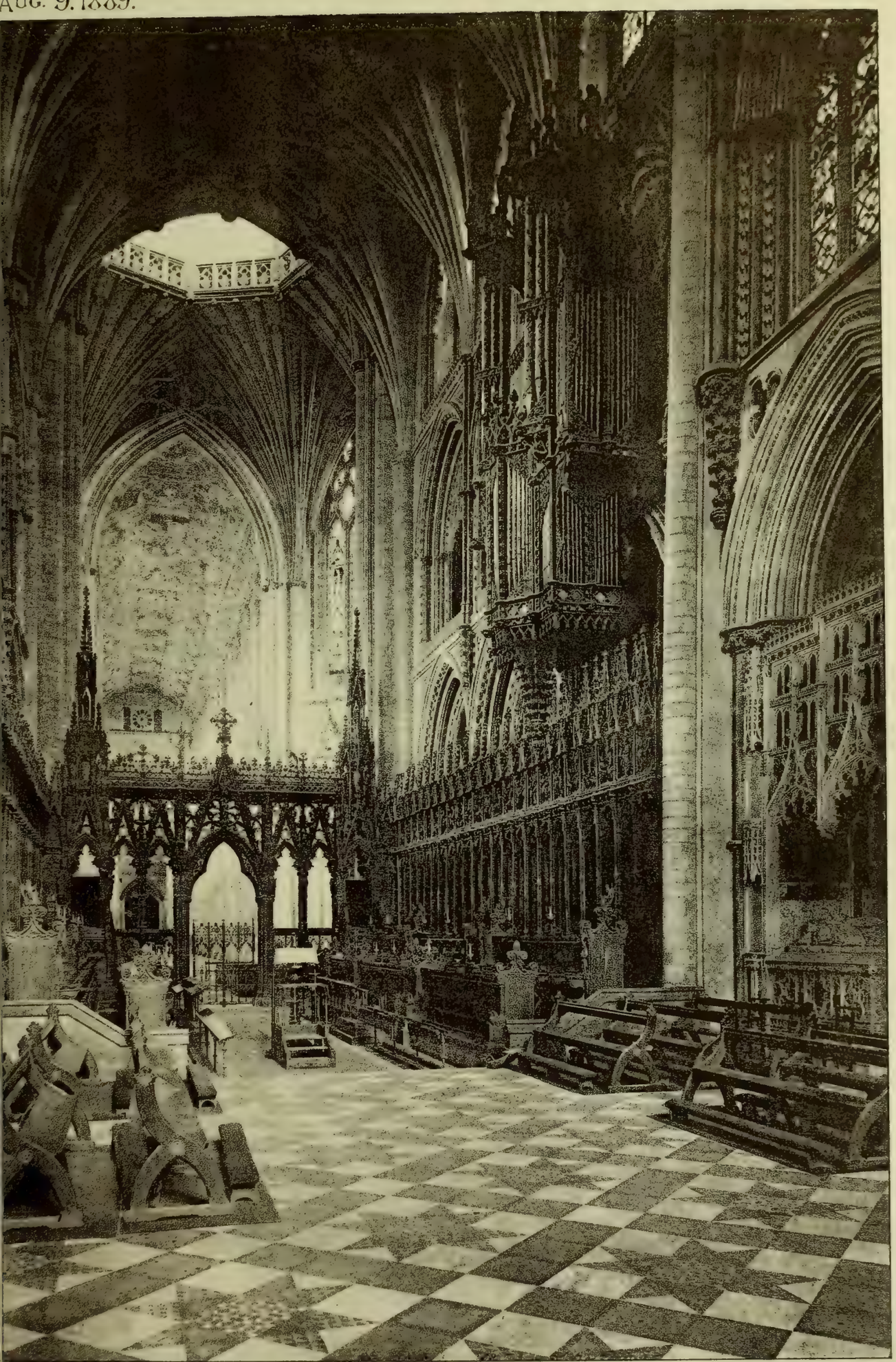
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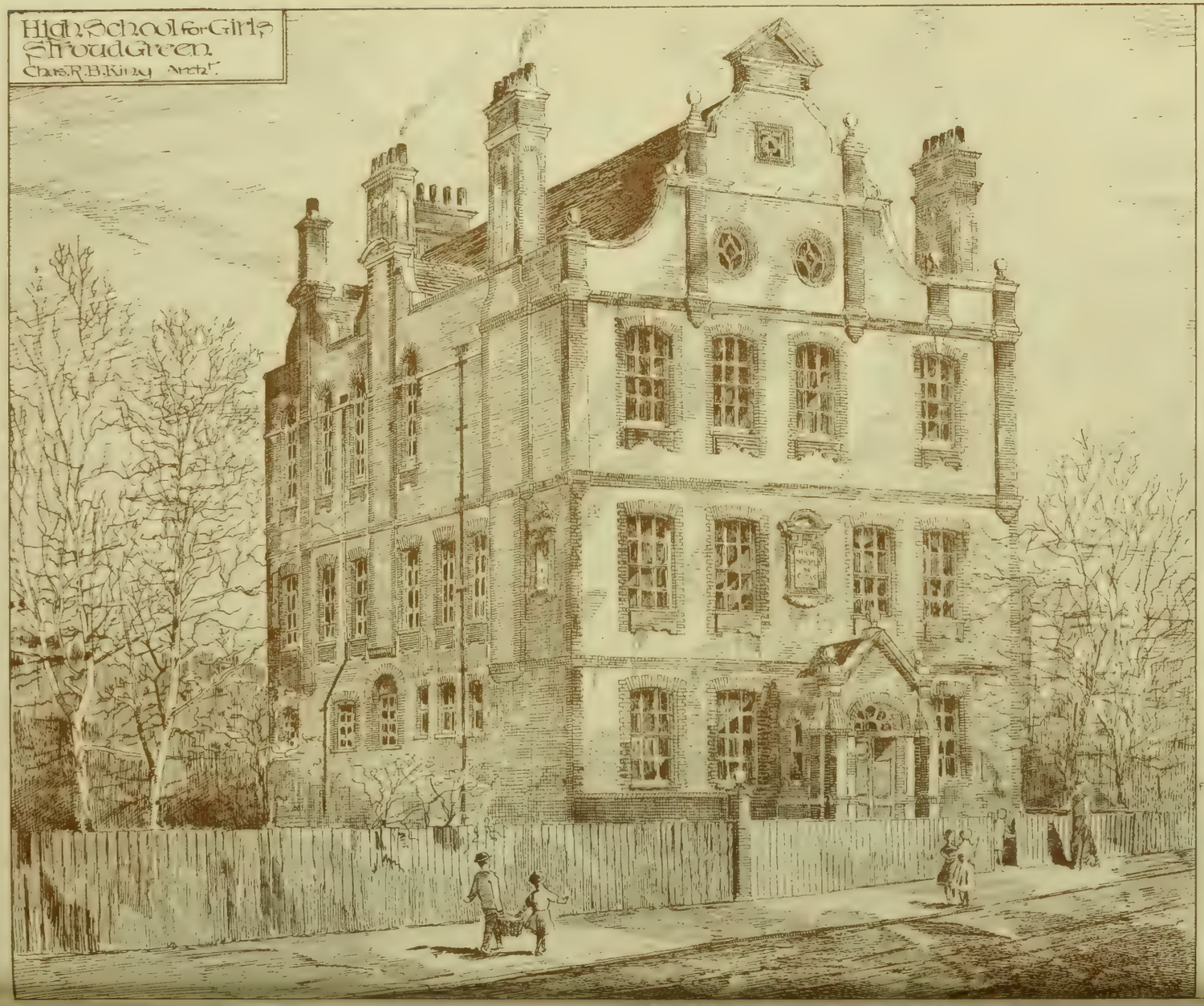
ELY CATHEDRAL, THE CROSSING.

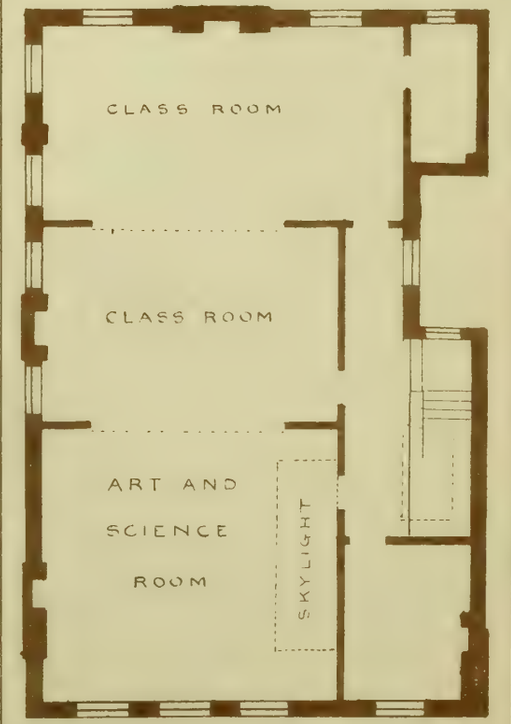


"Photo-Tint" by James Akerman 6 Queen Square London W.C.

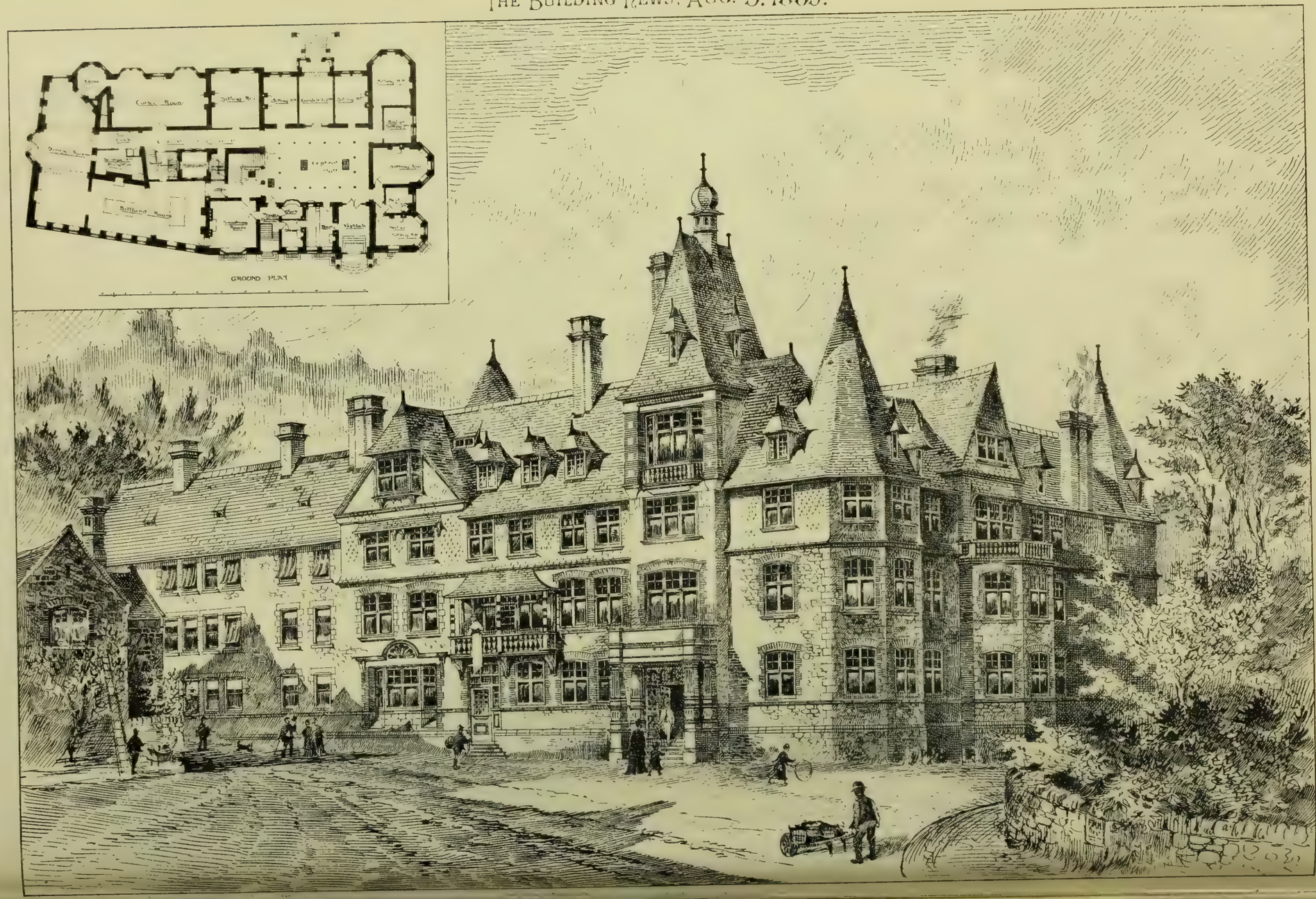
Ely Cathedral, Choir Looking West.

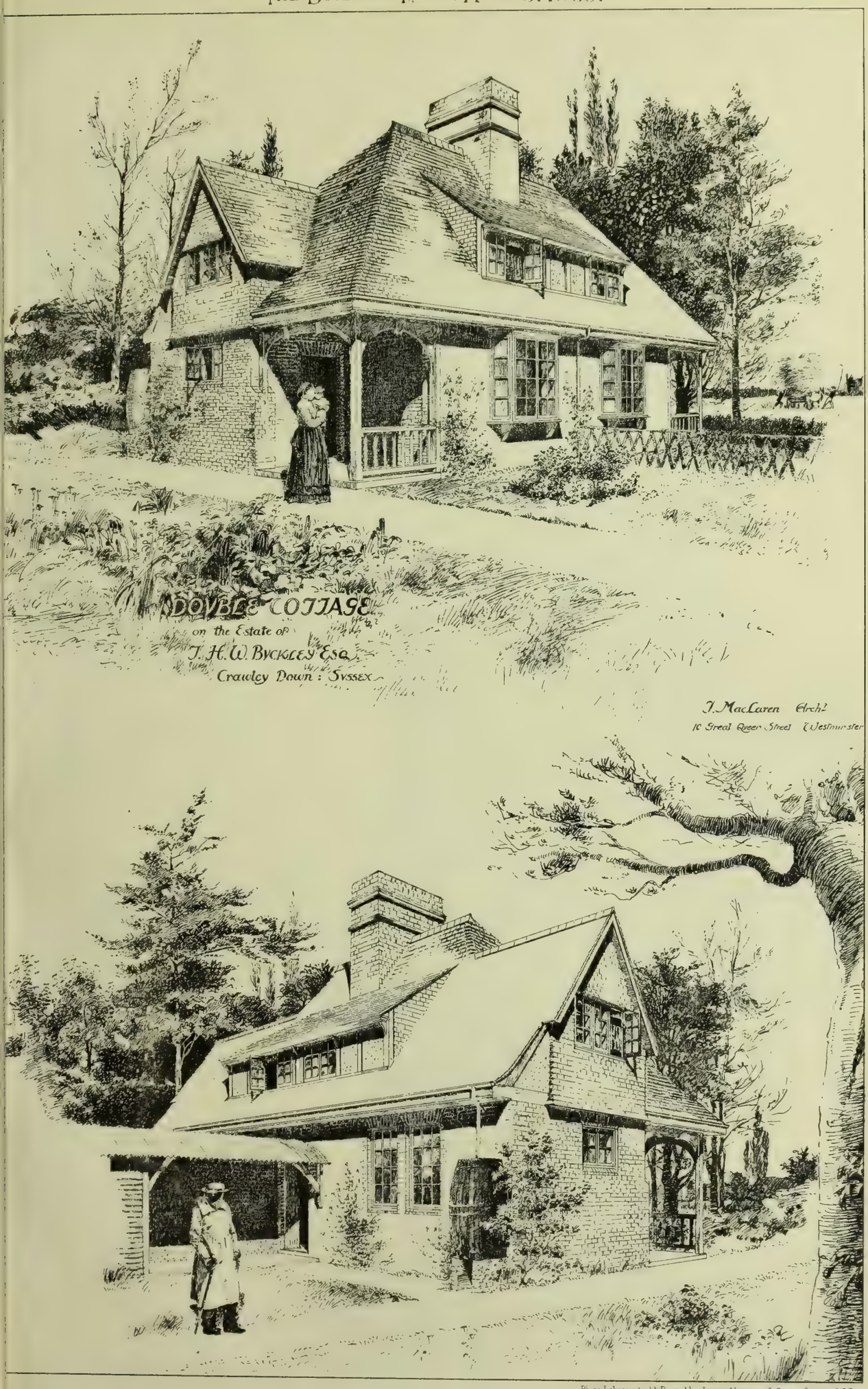
High School for Girls
Stroud Green
Chas. R. B. Kirby Archt.





PRINCIPAL PLAN.


GROUND PLAN



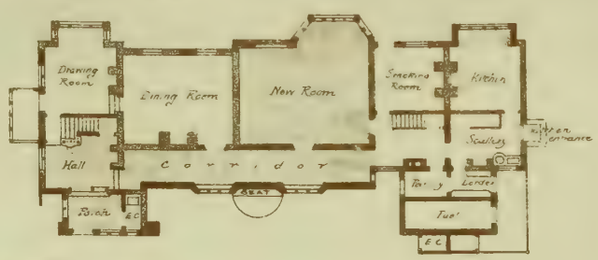
DOUBLE COTTAGE
on the Estate of
T. H. W. BUCKLEY ESQ.
Crawley Down : Sussex

J. MacLaren Arch.t
10 Great Queen Street Westminster

Photo Lithographed & Printed by James Akerman, 6, Queen Square W.C.

Cottage at Chilworth Surrey
for W. C. Roberts-Austen esqre F.R.S.

Plan shewing Alterations



Plan before Alterations

View before Alterations

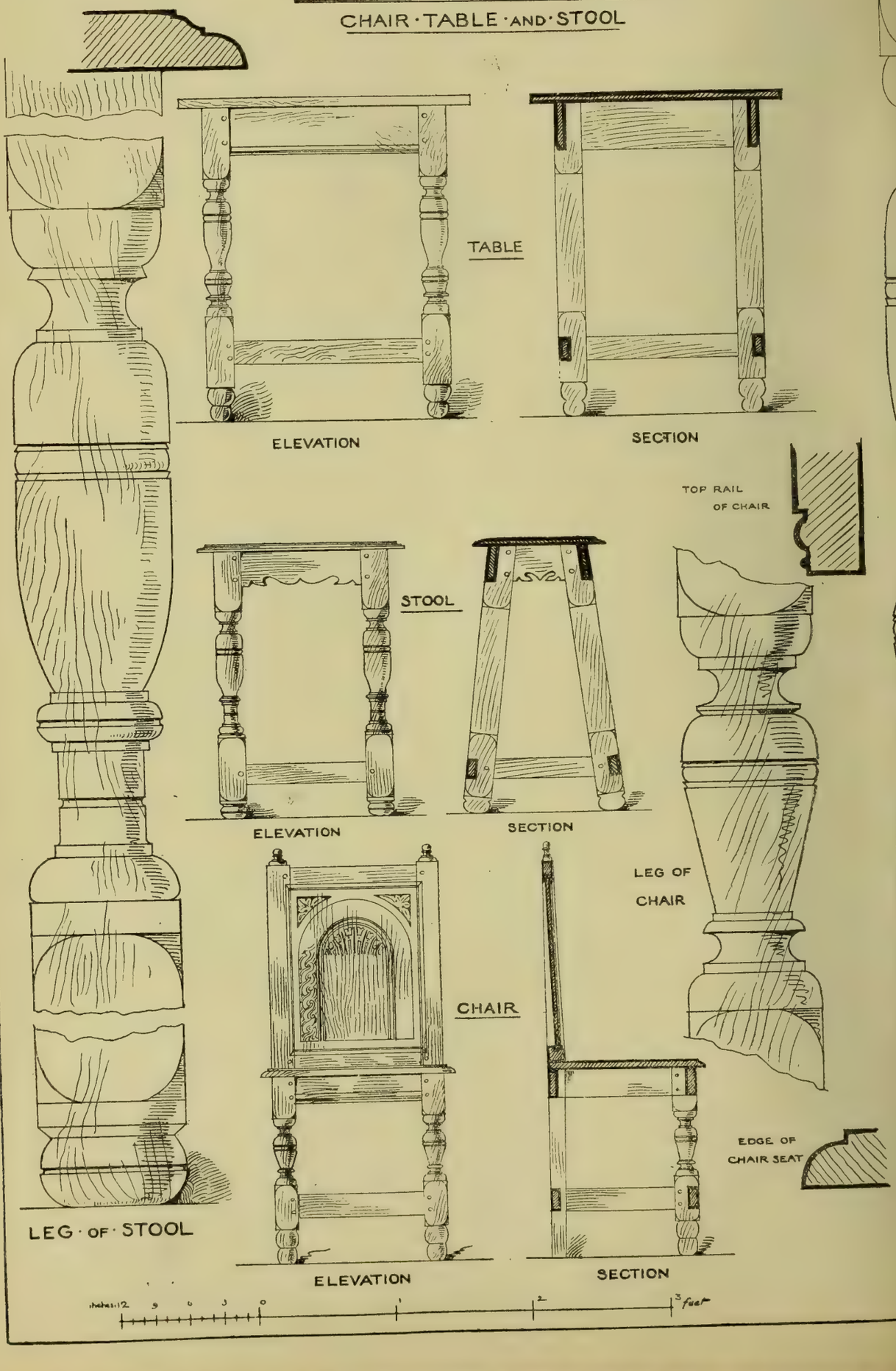
(Harrison Townsend) F.R.I.B.A. ARCHT
del. May 1886

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Marshland · Furniture · Norfolk · from Sketches by E. Guy Dawb

CASTLE - RISING ALMSHOUSES

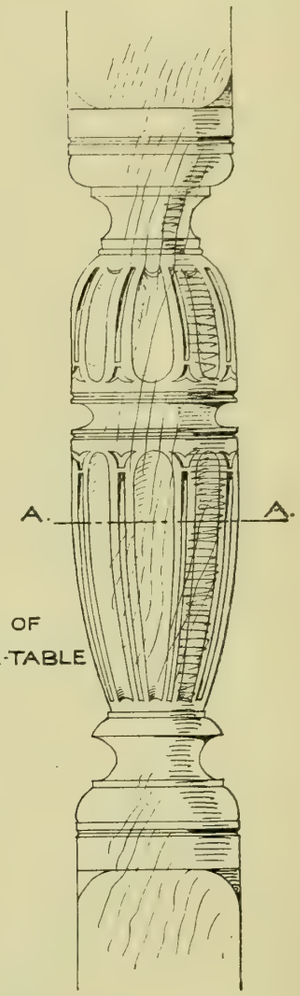
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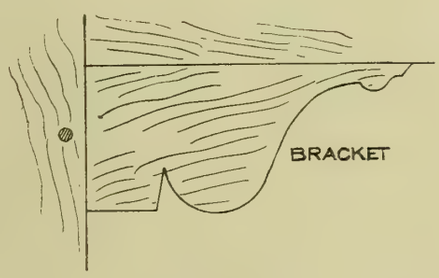
ARCHITECTURAL ASSOCIATION EXCURSION 1889

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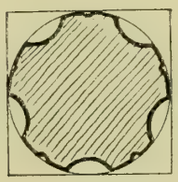




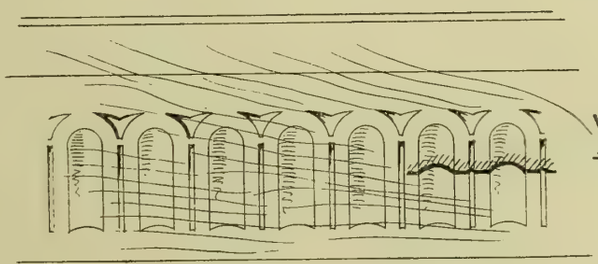
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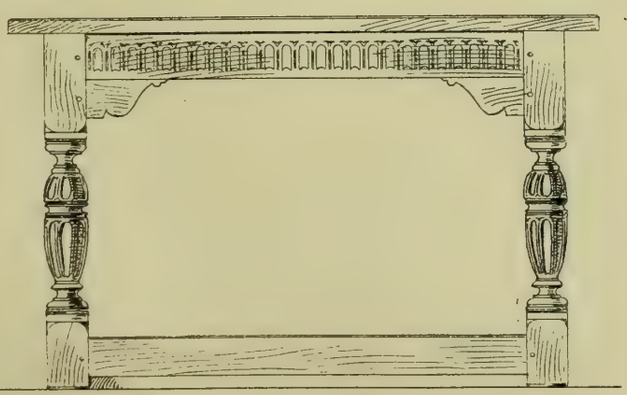
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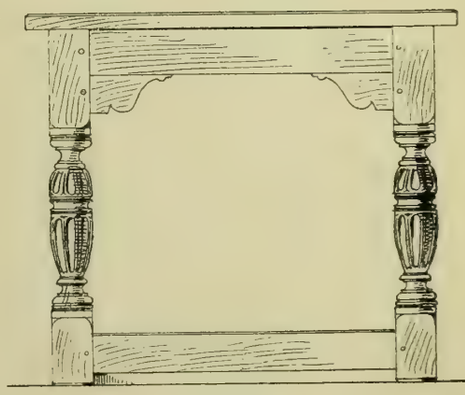
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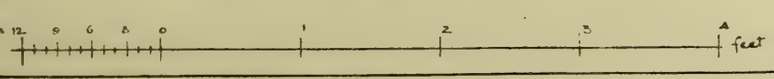
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E. Chancellor del 1889



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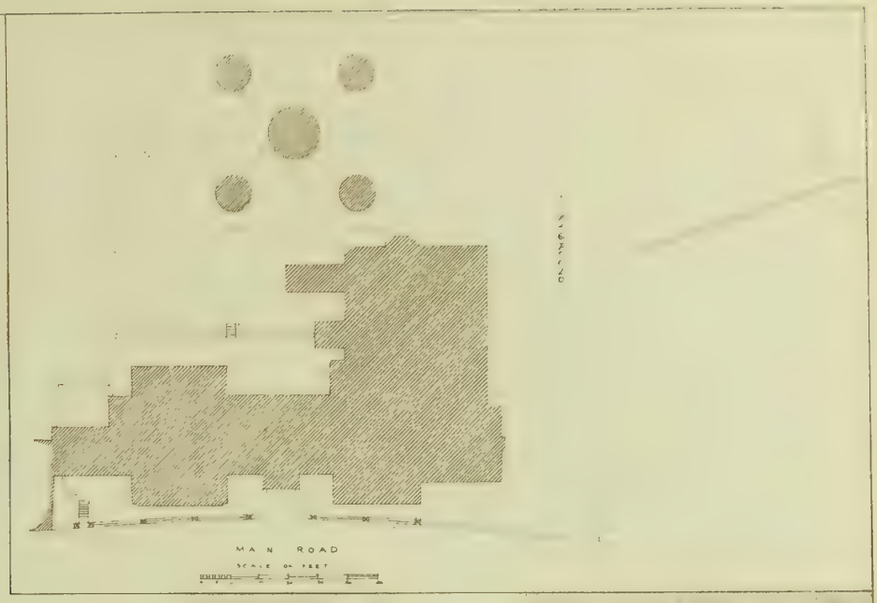




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ILS · BRISTOL – W·V·GOUGH · ARCHT

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1806.
FRIDAY, AUGUST 16, 1889.

TYPES OF MODERN BUILDINGS.

QUITE recently there has sprung into existence a number of public buildings which are the outward expressions of a highly complex civilisation, and which had no share in the adornment of our cities many years ago. During the Middle Ages all culture and the agencies which operated on the masses of the people were centred in and round the cloister. Cities like Salisbury, Wells, and Durham, have grown up, as Professor Freeman says, around the cathedral church; in fact, the monastic establishment or the cathedral church was the focus of the community—it was the building which gave the character and tone to the ancient city. The great church or college is not now the predominating edifice in our large towns; a hetereogeneous class of buildings have grown up, the larger number representing commerce in some form or another, the opulence of our merchant princes, municipal government, and the varied requirements of a highly civilised society. Of these buildings so numerous in our towns it is not our desire to speak here, but rather of a few of the more recent construction which may be referred to as the latest applications of architecture. In this category we place municipal buildings, board and technical schools, free libraries, museums, picture-galleries, infirmaries, railway hotels, residential flats, and other structures which have been erected for special purposes either for administration, education, sanitary purposes, and recreation.

It would require several articles to discuss these very different classes of buildings; but our object is now to point to only two or three of the most noticeable amongst them, the design and erection of which have lately very much engaged the architectural profession. We have heard the observation made, and no doubt many of our readers have done, that soon there will be little for architects to do; that we cannot always be building houses, churches, schools, and their like, and that the builder will, before long, supplant the architect in carrying out these stereotyped buildings, when the occasion for erecting additional ones arises. These pessimists probably never reflected that every age has brought with it new wants, nor foresaw that in a few years Acts of the Legislature would require the laying out of many thousands of pounds in the erection of board schools, public libraries, and fever hospitals in every town in the Kingdom, giving employment to a host of architects. Let us, for instance, take the requirements of the Education Department. It was quite a new problem that presented itself to the promoters of Mr. Forster's Bill: they sought to provide accommodation for scholars, for boys, girls, and infants in distinct departments, and upon the most scientific and sanitary principles, each of these classes of pupils to have its own entrances, playgrounds, schoolroom, and classrooms, arranged with particular reference to a central or general hall. Promoters and Government architects were set to work upon the problem of school arrangement and construction; evidence was collected, and after the study of the best German and Continental schools, a plan was decided upon in which classrooms were grouped round a central hall. After Mr. Robson's work on the subject appeared, schools began to be erected throughout London and the provinces, and continue to keep pace with the advancing requirements. These buildings, whatever we may think of them in an architectural sense, are typical of a great school-building era; they are an outgrowth of the age, and the future historian of the art will, perforce, take them as representing a very important development of architecture. The more recent examples of the London Board school are certainly distinctive enough in style, and this is an advantage. We want buildings that are characteristic. Some imposing examples of schools have been erected, in which the blocks have been well handled and grouped on the ground. The Goodrich-road school, Lambeth, recently erected, is one of these, and was built for 1,600 scholars, at a cost of nearly £18,000. In its plan it follows the large school at Lavender-hill; the girls' and boys' schools are in two stories, the infants have a separate block, and a hall on each floor in the centre is provided. There are nine classrooms, a drawing classroom being placed over the halls. The general grouping is in one large central block, with two cross-wings at the ends. The large hall forms a central block placed lengthwise, with entrances and cloak-rooms to the respective departments on each side of it, but set back; the end transverse wings are the school-rooms, and the classrooms are placed along the back of centre hall. In the new Lavender-hill block of buildings the style is boldly treated in brick, with high roofs and English 17th-century features. In front of the main block is a second block, quite distinct, for the instruction of pupil teachers, containing three classrooms for 36 each, and a large hall for examination and lectures, besides chemical laboratory and drawing classroom, gymnasium, &c. A third block is a cookery school. Architecturally, these buildings admit of effective grouping and imposing outlines, and as large sums are spent on them, the board schools of the metropolis may rank high among modern buildings.

Municipal requirements have developed another phase of architecture quite as prominent. Taking the metropolis alone, we have of recent years noticed the erection of vestry halls and offices and town halls, which have added considerably to the number of buildings requiring the highest artistic skill, and furnishing a field for the display of architectural and decorative art equal to that of ecclesiastical work. These buildings have, unfortunately, not always found suitable sites. The Fulham Vestry Hall, for instance, is cramped and crooked; better sites were found for the Hampstead, Holborn, and Kensington town halls, and buildings of some pretensions have been erected. Here, again, no ancient type of plan could be found; the architect has been obliged to interpret requirements and exhibit his power as an inventor of a new architectural problem. Its very complexity has given plenty of scope for variety of arrangement. The Holborn Town Hall affords a fairly good instance of a brick treatment. The proposed municipal buildings at Richmond, the design for which has only just been selected, presents another instance of planning on a narrow site, in which the difficulty of making the council chamber a principal feature has been experienced. The successful author has roofed this apartment separately from the offices; others have tried to balance it with some other feature in the front, and one or two clever attempts are made to break up the roof. The problem of all municipal buildings has been to assign to official and public departments distinct positions, and, if possible, to make the large hall a central feature of the design, or one that shall be expressed externally. The great buildings of this class erected at Glasgow, Leeds, Manchester, Birmingham, Wakefield, and other places represent the highest modern skill in dealing with the requirements of municipalities. In the earlier buildings, the principles of arrangement had not been fully understood; the several departments of official duties were often put together in a tentative manner, and some confusion arose. A wider experience of the working of these duties has enabled the architect to adopt a better classification of the rooms to be appropriated to clerks, surveyors, medical officers, accountants, inspectors, police, and the like; in the same manner the requirements of committees, and the desirability of convenient and well-lighted] communication between the offices, the public meetings that are held on various questions, have supplied data for a development of plan of a more perfect kind. The plans for the Edinburgh Municipal Buildings, which partook of blocks round a quadrangle, were examples of a very carefully worked-out scheme, as instanced in Messrs. Leeming's and Mr. Stark's designs, where the chief departments, with their respective corridors, the council-chamber, the burgh assessor's and city chamberlain's offices were placed as central blocks in the axis of principal entrance, and each had a separate corridor devoted to it. The council-chamber, with its suite of committee and reception-rooms, ought to form the principal portion of the design, and face the best aspect; it should have its own corridors, and the minor functions should be made subordinate to it. But if there is a public hall or court, the priority of place might be given it, unless there are two or three equally good positions which may serve for these purposes and become important façades. But we refrain from discussing details of plan. Enough has been said to show that municipal office design has been reduced to some system, and with the results of previous buildings before them, architects have better opportunities for determining their plans. We regard the municipal building as one of the most significant developments of structural art.

Allied to this class of building, though forming quite a distinct type, is the Public Free Library, of which we have several newly erected specimens in London. Some character may be given to this kind of structure by making the entrance wide and pronounced, by emphasising the news-room—giving it plenty of space and light. The reference library, also, should be large and well lighted. The Battersea Free Library, Lavender-hill, is an important red brick building with an octagonal bay to one angle of the news-room. The Durning Library, Lower Kennington-lane, Lambeth, is another brick and stone building, having a corner tower and an arcaded porch, Gothic in style; and a still more ornate design in red brick and terracotta has been erected at Norwood in a kind of Free Renaissance style. Although not altogether satisfactory types, these may be taken as specimens. The library has given a new departure in design, and if the public rooms, news-room, reference library, and magazine-room are well arranged round a spacious hall, and the librarian's house is not thrust too prominently forward, hiding the principal rooms, we might have a building expressing its purpose, and marked by some degree of originality. The site should be sufficiently large to give at least two good frontages—say at the corner of a street—and the private apartments can then be made to form a part of the return frontage. When the building is cramped in a street the librarian's rooms are generally placed on the first floor, and the public rooms thrown out as sheds or low buildings. The character of the structure is thus completely lost: it is made to look like a private house or a bank. The free library of a large suburb or town ought to be something more than a bare building: there ought to be funds enough for appropriate decoration, in the shape of terracotta subjects in relief or

sculpture representing the Arts of Peace. The busts of illustrious authors might fitly adorn panels or niches in the front; even the graces of the sister art of painting would lend a charm to the walls of the reading-room.

The technical school is another addition to the stock of new public structures in our towns. Of these we have some good models in London, Manchester (Owens College), Leeds, Bristol, Birmingham (the Mason Science College), Oxford, and other towns. The great hall with its grouped classrooms, the lecture-room, chemical laboratory, masters' and students' rooms, among other requirements have to be arranged in regard to lighting, sanitary science, and convenient means of communication. As yet the science of technical school planning and design is imperfect, especially as an architectural problem, and more data are necessary. We can only, in conclusion, refer to one more instance of the modern application of architectural skill to buildings—the Infirmary.

Abundant data have of late years been furnished; eminent medical men and hygienists have contributed their knowledge to the question of housing and nursing the sick of both sexes. The Herbert Military Hospital, Woolwich, was one of the first experiments made in England upon the pavilion system. Since then (1860) the principles of hospital construction have been greatly developed. The Leeds Infirmary was another building of the same class, but rather superior in its design, having five pavilions connected together by a corridor on the ground-floor. St. Thomas' s Hospital is a more advanced and architectural example of the pavilion arrangement well known to our London readers. A later and better type of infirmary planning is shown in the St. Marylebone Infirmary, Notting-hill, where eight pavilions, four on each side, are connected by a central corridor running east and west, each ward containing 28 beds. Other large metropolitan infirmaries on a similar type have been erected, and make imposing buildings. A large and recently-erected infirmary of architectural pretensions is that at East Dulwich, where the angles of pavilions or latrines are carried up as towers, with balconies between, Much remains to be done to make the pavilion principle more agreeable to the eye. The repetition of similar blocks and windows is distressingly monotonous, and could be obviated by making a few variations in the design of the blocks and administrative building, by breaking the roofs, and carrying up the conveniences at the ends of each pavilion as a tower. There is little attempt at style in any of the Metropolitan hospitals. Style can only be acquired after a set of buildings for any given purpose has assumed some degree of determinateness in plan and proportion. In the transitory or tentative stage the attempts to clothe a building in an appropriate dress are unsatisfactory, as we notice in the earlier Board schools and in some other newly-formed types of building. The subject invites attention to other kinds of buildings which have, of late years, called for special study, such as museums, picture galleries, town restaurants, and residential blocks of flats, in many of which types of plan unrevealed by previous experience have been followed.

THE ENFORCEMENT OF BUILDING BY-LAWS.

THE by-laws published by local authorities seem often to be a mere dead letter, if we are to judge by the manner local builders who have friends at the board treat the rules. Latterly there has been much discussion going on at Coventry with regard to the thickness of party-walls. The Rural Sanitary Authority refused to pass certain plans for tenements because the party-walls were of insufficient thickness, and not in accordance with the by-law, which stated that all party-walls should be 9in. in thickness. Surely how much thinner could they safely be? The plans submitted only showed 4½in. walls between the houses, and this the surveyor explained was the custom of the Coventry Urban Authority. The board confirmed the by-law, and passed a resolution to the effect that in future party-walls between all new houses should be at least 9in. in thickness, and that the by-law should be enforced. The resolution failed to please at least one member of the Board, and efforts have been made to rescind the rule.

We are glad to find one of the members of the board (Mr. Loudon) strongly protested against the flagrant violation of a by-law which lies at the very root of substantial and sanitary construction. The chief wonder is that any enlightened authority could ever have sanctioned 4½ party-walls simply because it was a custom to pass plans with walls of that thickness. Thus it was shown that, under the present system of passing plans, a builder erecting 20 houses would only be required to make the two external walls 9in. in thickness, and all the other 19 might be 4½in. In course of time each house might belong to a different owner, and then the absurdity of the definition that a "party-wall" was to be taken as meaning one between different building owners was at once apparent, for there would only be half a brick between the houses instead of a brick, as required. But if each house had been built by a distinct owner, the by-law would have been enforced in each case. From which illustration it is perceived that by building a number of houses together the by-law as to party-walls can be, and has been, evaded, greatly to the detriment of house property, and to the risk of life and property by the spread of fire. Another argument used by builders of a small class of houses is that a 9in. party-wall between one house and the next decreases the size of the rooms, and adds to the rent. Mr. Loudon very justly answered this objection by saying that the difference of cost would be too trifling, amounting to about 3s. 6d. per annum on each house. One of the aldermen insisted on this objection, nevertheless, and argued that the extra cost on a two-story house would be £10; there were no sanitary reasons for making a 9in. wall, the only objection being that sounds come through. The by-law, if enforced, he added, would be prejudicial to the speculative builder. These objections are samples of the kind of arguments used. The last reason, that it would stop speculative building in the suburbs, might be more fairly urged as a powerful argument for enforcing by-laws. Whoever knew of a town being benefited by "speculative" building? On the contrary, we can bring evidence to show that, on financial, sanitary, and moral grounds, the crowding of our suburban districts with cheap, ill-arranged houses has been a grievous wrong to the community.

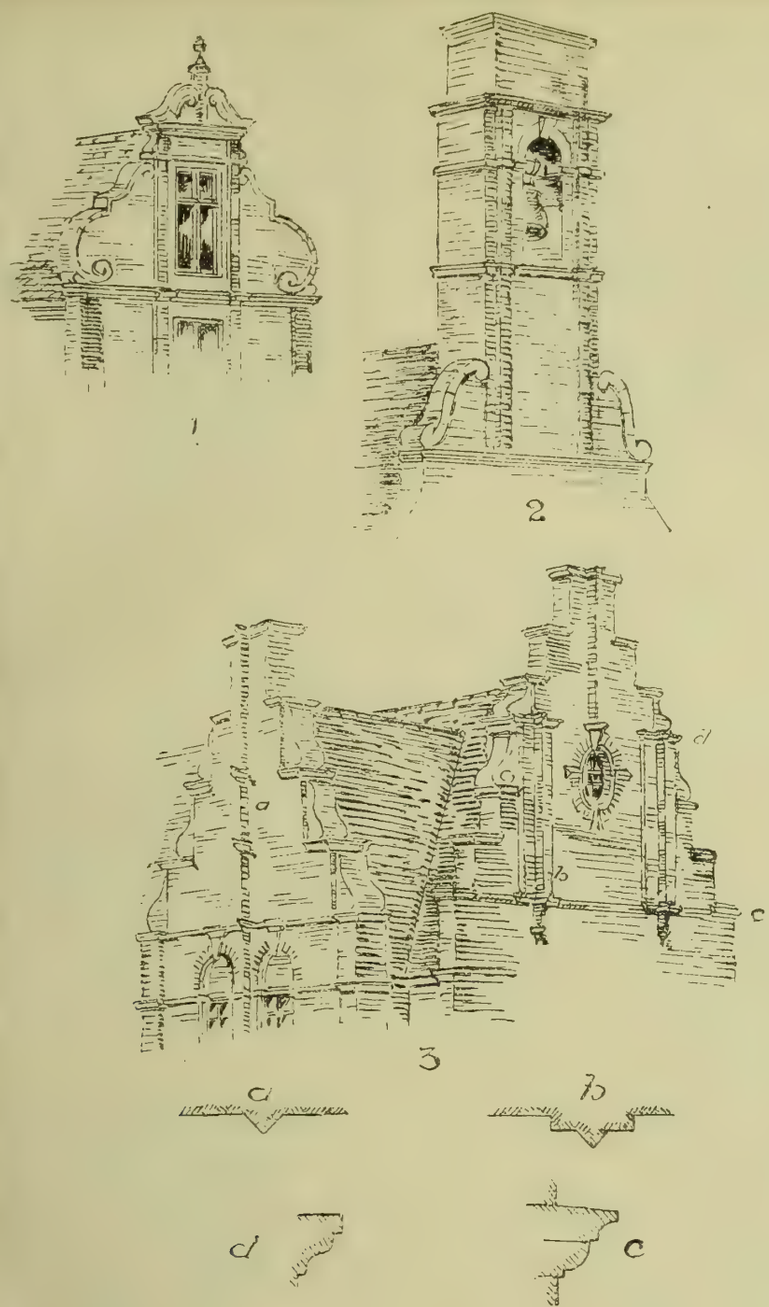
The opposition to the enforcement of the by-law comes from those who are interested in this class of building. Thus one alderman, a builder, says that 9in. walls would not prevent sound passing through, and that it would be necessary to have two 4½in. walls, filled in with sand; another argued that the by-laws required modification. Reading between the lines, it is evident that certain members of the Committee of the City Council are anxious not to put the by-law into force, and the resolution lately arrived at, that the "Committee do not see sufficient grounds for the general enforcement of the by-law, considering that the discretion of the Committee in the matter should not be taken away," is clearly in accord with this feeling. The rural authority, on the other hand, stand pledged to carry out the by-law. The position of the question is certainly anomalous. The urban authority are willing to pass plans with the thin party-walls, while the rural authority have pledged themselves to enforce the by-law. It is very evident the City Council wish to retain a discretionary power in passing plans for new houses; but by so doing they are practically setting aside by-laws which ought to receive their support. There are, we fear, many authorities who act in the same manner and defeat the intention of the by-laws by assuming a dispensing authority. Manchester allows 4½in. walls, but its death-rate is one of the largest. A code of by-laws to be of any real benefit to the public and the tenant ought to be uniformly enforced; if they cannot be put into general operation, or be administered impartially, they ought to be modified till they are capable of being applied with equal justice to all new buildings. The model by-laws as to party-walls are reasonable and moderate, and we do not believe anyone who wishes for sound sanitary construction can take an exception to the schedule as it applies to buildings of the tenement class. A half-brick party-wall is simply ridiculous, and if allowed to be carried out would be a scandal to our building legislation, and disgraceful to those who have to administer regulations in any town. Every builder of respectability knows that any less thickness of wall than 9in, is not only unsafe in case of fire, but exposes the tenant of one house to every noise and objectionable occupation that takes place in his neighbour's house. Gas and smoke could easily pass through such a wall, and domestic quietude, health, comfort, and cleanliness would be rendered impossible.

ARCHITECTURAL BRICKWORK.—XVI.

GABLE TREATMENT.

CONTINUING our examples of the treatment of brick gables and surface ornamentation, we may dwell for a few moments on how much effect can be gained by very simple means. The breaking up the surface of the gable wall by vertical shafts arranged either as square piers or triangularly is not costly. Plain bricks can be employed for example in such a gable-end as that shown on p. 138, Fig. A. No moulded bricks are necessary except those in the consoles at the base of gable, and the only expense is the increased labour in the broken bond. The plain step-like outline made by reducing the width of wall at successive stages, and flanking the ends by pinnacles in the manner indicated, has an imposing effect, much more in accord with good architecture than the curve and scroll style found in many of the buildings in Amsterdam. In the design *b* the steps are filled by console-shaped ramps cut in brickwork or cast in terracotta. Where curves are used the latter material is decidedly more satisfactory than cut or gauged work, as the terracotta is better burned and less porous, and can be moulded to the curve. Thus when volutes are introduced at the bottom or top of the curves or ramps, these finishes can be well cast in terracotta. An example of this kind of ornamentation is to be seen in some newly-built houses in Wigmore-street; also in the BUILDING NEWS of August 2, where two forms are shown, the curved copings being broken by small vertical shafts.

Our sketch 1, herewith given, is a gable form, examples of which may be seen at Chelsea, Streatham, Hampstead, Bedford Park, and other brick-built localities. The side scrolls or ramps abut against a centre window, which is carried up and crowned by a pediment, the ramps being finished below by scrolls either in gauged work or more commonly in terracotta or stone. This arrangement allows the vertical piers of the



window to be continued through the gable, and the outline is pleasing and more agreeable than when the piers are carried on keystones, or the design is produced without reference to the lower features of the elevation. We shall give other sketches of this treatment.

In our next sketch (3) two more examples of the "crow-step" arrangement are given, the design being taken from some brick cottages at Leicester. In the first gable a simple triangular-shaped shaft rises from the keystone of a lower window, and is carried up through the centre of the gable wall, no other surface relief being attempted. Level with the steps moulded brick members are introduced which give points of shadow, and the steppings have console-like ramps in the angles. The other gable illustrates a mode of breaking up the plain surface of the gable wall. The projection of these corbelled piers is small, about 2¼in., and in the centre is worked a triangular-shaped shaft. Sketch 2 is an example of a brick turret or bell-cot carried up on a gable, simple in its plan and picturesque in outline.

Surface relief is one of the essential conditions of successful brick treatment. Nothing can be more forbidding than a blank gable of plain garish red bricks, or a plain wall surface with square sash windows in it. By slightly breaking up the surface, either by the introduction of shafts and piers in the manner described, or by panels for carved brick or terracotta ornament, or by diapers, the eye is at once relieved, and is interested in following the design or device; besides which, the glaring red and new brickwork is subdued by the shaded outlines of the relief. Last week we noticed two simple modes of relieving the surface of brick walls in which ordinary bricks are used. Sketch *c* shows the upper part of a wall or attic in which a series of squares and circles are arranged, the width of each being one brick, having a projection of 1½in. to 2in. The design *e* is a square diaper pattern produced by bricks set in the manner shown between two stringcourses, making an ornamental band below gables of a house-front at Godalming. Several excellent examples of this kind of surface ornament are to be found in Surrey and Essex. The south aisle and porch of Feering Church, near Witham, executed in red brick, show examples of surface ornament in brick and flint. The plinth is composed of a series of trefoil-headed panels with flint-work, and the arcaded work below the string of aisle parapet, and the flat, stepped gable of porch are well-executed examples of brickwork. In the North German churches some clever panelling and traceried work in cornices are found, which we shall show when alluding to wall decoration. Herringbone work is often met with in the panels to half-timbered buildings in this country—a species of work more adapted to cottages. Our present remarks refer more to the surface relief of gable walls, such as can be produced by pilasters or engaged shafts, or by devices made in setting the bricks, and by means of diapering. The upper portion of gables are frequently treated in the latter manner. One very simple plan is to set the dark headers to form diamond patterns, flush with the wall, as we have noticed in alluding to Rye House. A broken effect of light and shade can be produced by forming the patterns by setting alternate bricks a little in advance of the rest of the surface. By making every header project an inch or so in the different courses, a pleasing and simple diapered surface can be formed; the headers thus brought out form a diaper, and cast a slight shadow. Other means of breaking up the surface will suggest themselves to the brick-setter, avoiding any more expensive kind of ornamentation.

THE SYMBOLISM AND ICONOGRAPHY OF EARLY AND MEDIÆVAL CHRISTIAN ART.—VII.

By George Ashdown Audsley, F.R.I.B.A.
(Author of "Handbook of Christian Symbolism," and several works on Architecture and Art.)

In addition to the three Greek and the three Latin letters which have been inscribed on the rays of the divine Nimbus, we occasionally find small emblematic ornaments placed thereon. An interesting example, from a piece of Italian sculpture of the 10th century, is figured in Bosio's *Roma Sotteranea* (Rome 1632): the sculpture shows the divine Lamb (symbol of our Lord) invested with the tri-radiated Nimbus, on the three rays of which are placed small Latin crosses, Fig. 18. Here again we have a



Fig. 18.

proof that the three rays have no connection with a cross, for one cross marked with three other crosses would simply be a specimen of redundancy. The crosses evidently allude to the Passion of the "Lamb of God," whilst the tri-radiated Nimbus is, as in all instances, expressive of the Trinity. The ornamentation on the rays and also on the field of the divine Nimbus, is very frequently without any emblematic significance; but in goldsmiths' work, when the Nimbus is studded with precious stones, it is highly probable that the jewels have, in many instances, been selected on account of their symbolical significance.

It only remains for us to direct attention to one or two forms which the Nimbus, as met with in portraitures of God the Father, assumes in late art. In Fig. 19 is a portraiture of God the Father from a fresco by



Fig. 19.

Melozzo da Forli, 15th century. Here we meet with the tri-radiated Nimbus in probably its latest treatment, the rays being so formed and so proportioned to the rest of the field that much of their distinctness is lost. In Fig. 16 (Article VI.), the Nimbus of the crucified Christ has rays of somewhat similar curvature, but much more distinctly marked in relation to the field.

The forms of the Nimbus of God the Father, which have most exercised the minds of archæologists and students of iconography are the square and lozenge. What

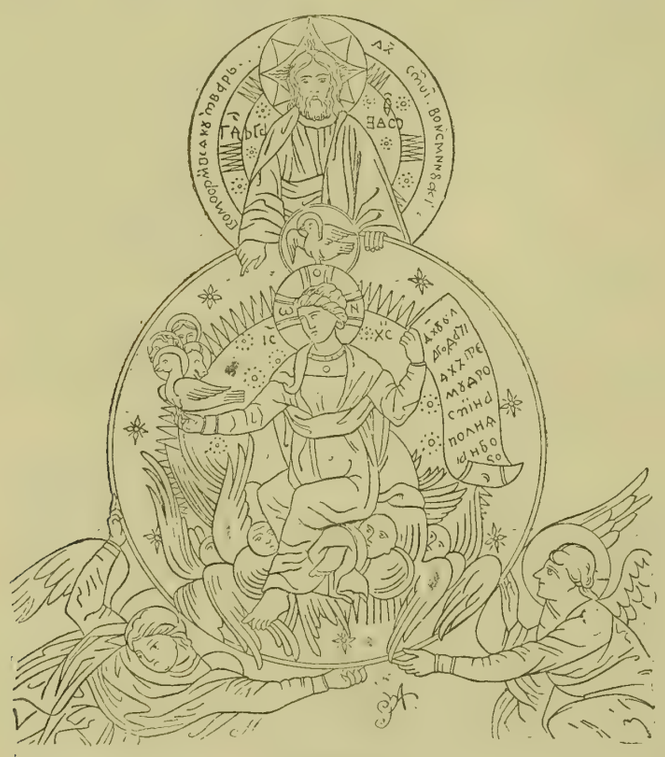


Fig. 21.

Didron says respecting these forms is so much to the point that we quote it without apology. He remarks:—"Que le triangle se donne à Dieu, puisque Dieu est triple (DEUS TRINUS UNUS, dit Lactance), on le conçoit; mais qu'on lui applique le carré, c'est moins explicable. En effet, le carré, dans les opinions pythagoriciennes et néoplatoniciennes, symbolise la terre; or, au figuré comme au réel, la terre est inférieure au ciel, dont, suivant les idées anciennes, elle ne serait que le piédestal tout au plus. Cependant on a donné quelquefois à Dieu et à Dieu le père des nimbes carrés: il est difficile d'expliquer ce fait, surtout quand on sait qu'en Italie on a gratifié de ce nimbe rectangulaire des personnages vertueux, mais peints de leur vivant, et pour les distinguer des personnages ou des saints morts. Le vivant, quelque saint qu'il soit, est toujours inférieur au saint mort, de quelque peu de réputation qu'il jouisse; le vivant est un homme, le mort canonisé est presque un dieu. De là le carré, expression géométrique de la terre, orne la tête des vivants, et le cercle, forme céleste, décore la tête des saints du paradis. Mais pourquoi donc le Créateur de tous ces êtres vivants ou morts porte-t-il un attribut qui le rabaisse jusqu'à la condition de sa créature, et de sa créature vivante et non glorifiée encore? Il faut dire que le nimbe carré donné à Dieu est ordinairement concave et non droit sur les côtés, tandis que celui des vivants est en ligne droite et non en ligne arrondie en creux; il faut dire surtout que ce nimbe de Dieu est presque toujours posé sur angles, en losange, et non pas sur les côtés comme celui des vivants. Raphaël aussi donne au Père le nimbe en losange, mais à côtés droits. Peut-être que ce losange fut regardé par les artistes comme un emblème purement mystique, comme un symbole dégagé de tout élément matériel. Dans ce cas, le nimbe en losange ne représenterait plus qu'une idée analogue à celle qui est figurée par le nimbe triangulaire. Enfin, dans l'abside de Saint-Jean-de-Latran, à Rome, une mosaïque exécutée de l'an 1288 à 1294, sous le pape Nicolas IV., offre Dieu le père, sous les traits de Jésus,



Fig. 20.

sortant à mi-corps des nuages; au-dessous de lui est le Saint-Esprit, et plus bas est la croix richement décorée, la croix gemmée. Le Père porte un nimbe qui n'est plus en losange, comme dans les exemples précédents, mais carré comme ceux des papes Grégoire et Pascal: Dieu est vivant. Mais ce nimbe carré est inscrit dans un nimbe circulaire; or le cercle est l'emblème de l'éternité: Dieu est donc éternellement vivant. Je suis et je serai, dit l'Eternel dans plusieurs passages des livres sacrés; voilà ce que peut signifier ce carré saisi dans l'aire d'un cercle, car la vie est inscrite dans l'éternité."

Didron mentions the curious example of a square Nimbus investing the head of God the Father which is to be seen in the Late



Fig. 22.

15th-century mosaic in the church of St. John Lateran; and the square Nimbus, placed lozengewise, attributed to Raphael, is to be seen in his "Disputà." In Fig. 20, from a miniature in an Italian manuscript of the 14th century, preserved in the Royal Library at Paris, God the Father is invested with a lozenge-shaped Nimbus with concave sides: and in Fig. 21, from a Byzantine painting, in tempera on wood, attributed to the 14th century, God the Father is invested with a circular Nimbus, within the circumference of which are two lozenge-shaped figures with concave sides, forming a species of star. The Dove, the symbol of the Holy Ghost, has a plain, circular Nimbus, whilst God the Son is invested with the tri-radiated

Nimbus in the Greek form. We shall more particularly speak of this interesting example when we treat of the Aureole and Glory. However curious and interesting such shapes of the Nimbus may be to the student of Christian Iconography, little value can be attached to them on account of symbolic expression. They never seem to have become favourites with the artists of the Middle Ages.

THE NIMBI OF ANGELS AND SAINTS.

The angels which appear in works of art executed previous to the 5th century were, so far as we can learn from existing examples, invariably represented without the Nimbus; but from the 6th century onwards all through the mediæval period angels were invested with the attribute. The Nimbi given to all the orders of the Angelic Hierarchy are circular in form, with their fields either plain or covered with numerous radiating lines or rays. Examples of the many-rayed Nimbus of 9th-century date are to be seen on the celebrated "Palliotto" preserved in the church of St. Ambrose at Milan; in the 13th-century fresco paintings by Cimabue and Giunta, of Pisa, Fig. 22; in the church of St. Francis at Assissi: and in numerous works of both eastern and western art. In Greek paintings the field of the Nimbus is tastefully ornamented; this will



Fig. 23.

be more particularly noticed when we come to speak of the colour and artistic treatment of the Nimbus. In addition to the perfectly plain and radiated fields, other designs were frequently adopted by Western artists for the adornment of the Nimbi of angels; sometimes we find them formed with broad borders richly ornamented; as a disc or ring surrounded with stars; or as a disc with an inscribed margin, as that round the head of the archangel Raphael, in a painting of the Coronation of the Virgin, by Barnabas, of Mutina (A.D. 1374). A drawing of this painting is given in D'Agencourt's *History of Art* (Painting pl. 133). Although we have stated that all through the Mediæval period angels were invested with the Nimbus, we do not wish it to be understood that they were invariably adorned with the attribute. In Italian art of the 13th and 14th centuries we occasionally find them without, whilst other personages associated with them have the Nimbus. Illustrations of this fact exist in the ciborium of the church of St. Paolo (fuori delle mura), and in the monument of Cardinal Gonzalvo in the church of St. Maria Maggiore, at Rome—both works of the 13th century. In the latter example the angels which stand at the head and feet of the effigy are devoid of Nimbi, whilst the Virgin and Child, St. Matthew, and St. Jerome, represented in the tympanum, are all invested with the attribute. In the celebrated series of figures representing the Celestial Hierarchy in the glass of New College Chapel, at Oxford, the figures representing the choirs of Seraphim, Cherubim, Thrones, Virtues, and Archangels are invested with plain circular Nimbi; but those

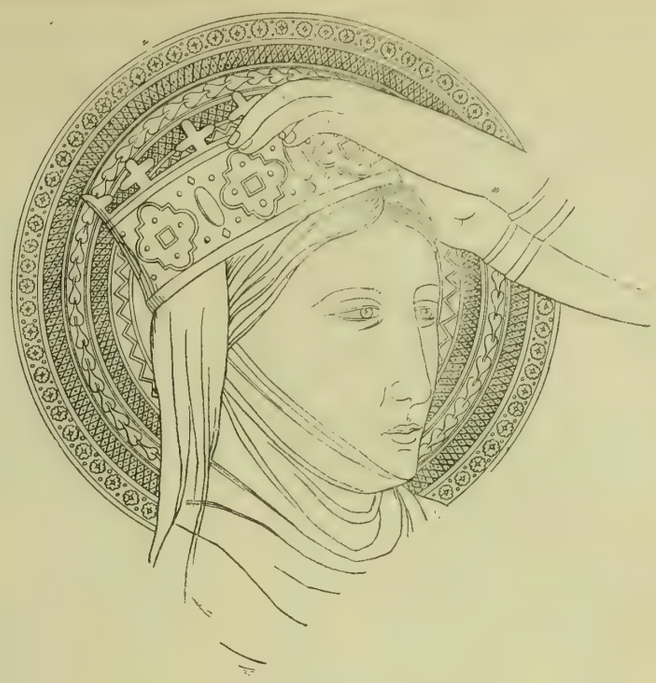


Fig. 24.

representing Dominations, Principalities, Powers, and Angels have no Nimbi. It is difficult to account for the distinction here observed, and, so far as we have been able to ascertain, the treatment is unique. From the above notes it will be seen that the artists of the Middle Ages observed no defined or accepted rule with reference to the application of the Nimbus to the heads of their angels; but if there are any rules to be observed in Christian Iconography, one certainly is that all angels should be invested with the attribute under consideration as a special indication of their holiness and dignity.

Before we leave this branch of our subject we may direct attention to the "Angel of the Divine Will," as met with in Greek art. This is a portraiture of Christ under the form of a winged angel, but invested with the divine Nimbus inscribed with the three letters—omicron (ο), omega (ω), and nu (ν)—as in Fig. 23, from a Greek painting of the 15th century. In addition to the three letters on the rays of the Nimbus, in this example, the two monograms or abbreviations of the name Jesus Christ (Ιησους Χριστὸς) ΙC. ΧC., inscribed in the upper spaces of the field, between the rays. This leaves no doubt as regards the person intended by the artist. In the painting from which Fig. 23 has been taken there are also depicted the archangels Raphael, Michael, and Gabriel. All are invested with large circular Nimbi, on the fields of which are the single initials of their names, in Greek characters. This simple mode of indicating the personage invested is very often met with in Byzantine representations of the archangels.

The Nimbi which have been commonly used by Christian artists to distinguish the saints who have lived on earth, do not differ in any essential points from those assigned to the angels. They are invariably circular, and their fields are either perfectly plain or ornamented with many rays or purely fanciful devices, according to the taste of their designers or the materials in which they are executed. There is, however, one



Fig. 25.

point of difference which obtains in Western art—the Nimbi of angels are rarely inscribed in any manner, whilst those of saints are very frequently inscribed with their names.

First in order of importance comes the Nimbus of the Virgin Mary; and it, when it is *defined*, assumes invariably the circular form. In the earliest portraitures of the Virgin the Nimbus is commonly omitted; but we find that about the 4th century the plain circular attribute was applied to her head. The curious painting on panel attributed to the end of that century, now preserved in the church of St. Maria Maggiore, at Rome, shows the Virgin and Child, both

having the plain circular Nimbus. From this century onwards throughout the Middle Ages the Virgin was very rarely depicted without the attribute, we may say never correctly without it. The most common treatments of the defined field are the many-rayed, the star-bordered, the jewelled, the inscribed, and the surface-enriched. Of the last-named treatment, the Nimbus shown in Fig. 24, from a painting of the Coronation of the Virgin by Giotto, affords a good example. An excellent instance of the Nimbus with stars arranged within a narrow margin is to be found in a fine painting of the Virgin and Child surrounded by adoring angels, by Cimabue, in the Academy of Fine Arts, at Florence. It is just worth mentioning that the Nimbus of the Child has four stars placed on its field, in the spaces left by the head and the three rays. Of the many-rayed Nimbus so many examples exist that it is unnecessary to specially mention any. In Russian and Polish Christian art we meet with very rich treatments of the Nimbus, often wrought in gold or silver gilt, and studded with jewels. These are sometimes covered with many pointed rays, and sometimes have the rays issuing from the circumference of the circular field. These metal Nimbi are frequently very elaborately ornamented. In the case of statues of the Virgin, metal Nimbi have frequently been used: these were either flat or pierced discs, commonly gilded, and sometimes enriched with enamels or jewels. These remarks apply eqally to the Nimbi of statues of other saints.

In Fig. 25, which shows the Virgin and Child, St. Joseph, and St. Peter, of Milan, from a tempera painting of the 16th century (School of Naples), a late and unusual form of Nimbus is presented. At first glance it seems to bear a striking resemblance to the tri-radiated Nimbus; but it is evidently a fanciful treatment devoid of significance. The Nimbus of the divine Child is also devoid of any direct symbolism, the correct tri-radiated character having been ignored. The late date of the painting, however, accounts for the purely fanciful treatment.

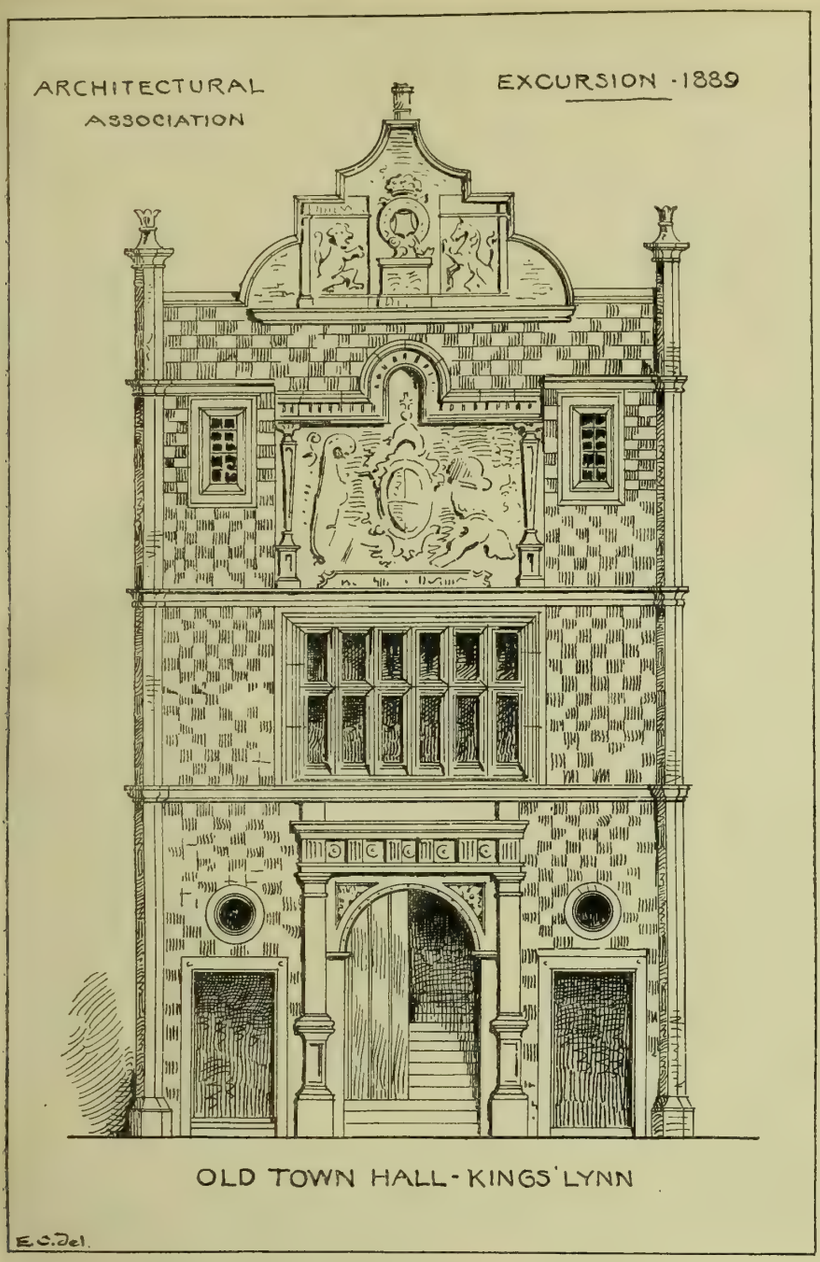
In Latin art, the Nimbus of the Virgin is frequently inscribed, round the border, with her name, as in the fine painting by Masaccio in the Academy of Fine Arts at Florence, in which her Nimbus bears the words "MARIA . GRATIA . PLENA . DOMINUS." In Greek art the Nimbus of the Virgin is very commonly inscribed with her name in an abridged form thus: MP . ΘΥ. These letters are sometimes placed on each side of the Nimbus, but outside its field.

The Nimbus of the Virgin, especially when she is delineated wearing a crown, is frequently *undefined*—that is, it is not bounded by a circular line or border. Several stars disposed in a circular fashion round the head; radiance indicated by many rays of light, either assuming an irregular or star-shaped outline; and a circular field surrounded by a star-shaped arrangement of rays are common forms. Of the late and meaningless horizontally-placed disc or ring, floating above the head, nothing need be said here. *(To be continued.)*

THE ARCHITECTURAL ASSOCIATION EXCURSION, 1889.—II.

[WITH ILLUSTRATIONS.]

THE general outline account which we printed last week of the district round King's Lynn when giving the programme, which has by now been almost carried out, furnished a sufficient introduction to our more detailed description of the several places visited. The weather on Monday was most unfortunate; but the buildings seen were of much interest. They comprised seven churches, situated to the west of the headquarters, and commenced with Wiggenhall, St. Germains, which was reached after half-an-hour's drive across the fens. There is not much to be seen here except the 15th-century stalls in the nave, which, though somewhat coarse in scale, have some rather good carvings, those on the south side illustrating the Seven Deadly Sins, with persons represented in a characteristic manner, each group differing from the other, except in one particular—viz., that all are shown about to enter the jaws of Hell. The chancel has arcades opening into the side chapels, that on the north being now separated from the aisle of the nave, and so made to form a vestry. The eagle lectern is a good original brass one, and there is a refined Jacobean pulpit in the church, worth sketching for its detail. Mr. Brown, an architect at Lynn, restored the church, and removed a great west gallery about seventeen years ago. The new oak stalls in the choir, designed to follow the proportions of the old seats in the church, compare very unfavourably with them in respect to their enrichments. St. Mary the Virgin, in the next Wiggenhall village, has some much richer stalls, beautifully sculptured and elaborated with niches at the ends, containing full-length figures of female saints or virgins, with the letters V.R. over them. We give some detail drawings to-day by Mr. E. Guy Dawber, which are more valuable than any mere description of them. The seats are very varied in their carvings, and their open traceried backs are exceedingly handsome in effect. The brass eagle lectern bears the date of 1518, and is in capital preservation; while the Jacobean font cover, bearing the year 1625, is typical of its style, and is as uncommon as it is picturesque, with the Pelican in her piety boldly surmounting the conical roof of the canopy. There is a boldly-proportioned brick tower at the west end of the church, and the walls of the rest of the building are covered with stucco, like most of the churches in this neighbourhood. Messrs. Gillow and Co. did up St. Mary's Hall hard by about 20 years ago, and the same firm repaired the church, adding new stalls and screen work to the side chapels. The ancient Perpendicular wooden rood screen was cut down at some time or other, and stands in fragments at the west end of the nave, with Jacobean terminals introduced along what was the sill rail of the open portion; but there is no other screen erected in its place, as the guide books have stated. The house just referred to is of no architectural interest. Continuing our itinerary we arrive at the lofty and spacious church of Wiggenhall, St. Mary Magdalen, with a tall, Decorated nave arcade and wide aisles, of later date still, the whole being covered with a capital roof, having carved angel terminals to the intermediates, projecting from the wall-plate above the Perpendicular clerestory. There are some open screens, forming lobbies at the west end, one being used as a vestry. The chancel inside is uninteresting, and the nave pewing is, comparatively speaking, of poor character. Outside the church makes a noble group from the east end, showing the brick angle turrets to the gable on the chancel arch. The pulpit once was reached from the rood-screen stairs; but the old painted 14th-century screen is now only represented by a panel or two located at the other end of the building. In the windows there is some old glass, and in the floor of the sacrarium the ancient altar stone of the parish is placed, with its five consecration crosses. This valuable and sacred altar should be removed unquestionably, and restored to its original use by mounting it in a stout oak frame, and placing it on the Jacobean altar table now occupying the post of honour. This piece of furniture is perfectly strong enough to carry the weight, and the parish, whatever else its needs, will be fortunate in the restoration of the ancient altar of its forefathers. Now the slab serves only as a paving-stone. There are remains of an interesting fresco over the chancel arch; but it is too broken to be of much value. The Confessional squint out of the wall of the north aisle at the west end is to be noted. Mr. R. J. Withers, of the Adelphi, restored the church partly; but the aisle roof wants doing, as it leaks like a sieve. Leaving the Wiggenhalls, a drive of an hour's duration in the pouring rain and sweeping east winds brought the excursionists to one of the noblest and most celebrated churches in the county—viz., West Walton; but its almost ruined condition is a disgrace to the diocese and everybody concerned with the parish. The rector has been long non-resident, and the curate in charge has obtained leave from the bishop to hold services in the chancel, which ought to be held in the church, and so the sanctuary is crowded up with school seatings, as the nave is likely to fall in at any moment. The living is valued at about £1,500 a-year. We published some short time ago a monograph of this grand church by Mr. Needham Wilson (see BUILDING NEWS, June 6, 1884), with a view illustrating the great detached tower which stands as a porch at the entrance to the churchyard. This, like the main building, is chiefly Early English work. It is groined, and is very rich and beautiful; but, like the church, sadly needs repair. The lightning struck off one of the four pinnacles last week only, and caused other damage. The deplorable state of the nave has been growing gradually worse, utterly neglected and unmended for the last twenty years at least, and still the Society for the Protection of Ancient Buildings, as far as we can hear, has done no more to bring about its renovation than the neighbours and church authorities of the diocese, who will soon have the fabric about their ears, and one of the most beautiful 13th-century buildings to be found in England will become a heap of stones. The roof over the nave seems to have been lowered, owing, possibly, to the settlement outwards of the nave arcade, which made the span too wide for the roof. This lowering has brought the hammer-beam trusses down below the clerestory arcading without any reference to the spacings of the arches. The roof requires taking down at once, repairing, and re-erecting at a higher level—say 4ft. to 6ft.—above its present position. The angels which enrich this once beautiful roof are only put to the intermediate principals, of which there are two to each chief bay. The arcading below does not follow the spacing of the nave arches. This latter has circular shafts with four detached Purbeck marble columns, one on either of the cardinal faces of the pier. The caps are eminently typical of the style, and as the illustrations which we give to-day, from the sketch-book of Mr. Arnold B. Mitchell, will show, are almost identical in their foliations with those in the choir of St. Margaret's, Lynn. The leafings are, perhaps, a trifle coarse, but the mouldings are refined and rich, and quite worthy of the period. The original aisles were pulled down in the 14th century, and the present very wide ones erected, when as much of the earlier work was reused as was found convenient. Thus the south porch was made much shorter, and the return arcading to the walls cut in two. In the south aisle is a wonderfully proportioned and beautiful geometrical window of the best period, and in rebuilding it to make room for the piscina, &c., of the chapel in the aisle, the shaft has been shortened considerably on the east respond with curious effect. The Perpendicular stonework done here is very poor; but the roof over this aisle has moulded purlins and wall plates. The roof of the wider north aisle is more suitable for a piggery, and is shockingly patched. The grand east portal consists of two doorways, divided by an exceedingly slender marble column, and inclosed by a rich semicircular arch of several orders. The whole of this front was falling outwards, when in Tudor times the immense buttresses which flank the doorways were introduced. The west window is of Perpendicular character, and the roof is brought down close on to its head. Over the piers inside are some curious circular 17th-century paintings representing the arms of the Twelve Tribes, as described in the 24th chapter of Genesis. The pewing in the nave is of painted deal. Walsoken Church was next seen. Here the Norman arcade in the nave and chancel, and the arch of the same date dividing the building into two, are rich and interesting. The interior is roomy and lofty, with a Perpendicular clerestory and handsome roof of that period, having hammer-beams cutting through the four-centered arch of the principals. The pitch of the roof is very flat, and this makes the hammer-beams look as if they were tilting downwards; but when sighted this is found to be not so. The ends of these beams have carved and coloured angels, and also there are others in the cornices with beautiful niches below the wall posts, and carved out of them with full-length figures seated under canopies. To the south aisle of the choir there is a very delicate and handsome oak screen, florid in varied traceries, and enriched with vigorous carvings. The outer order of mouldings has, for the most part, gone; but sufficient remains to show what it



once was like. Some have thought it was originally the rood-screen to the chancel, and although the width nearly corresponds, the central doorway opening is too small for the principal entrance to so large a choir. The rood-screen, whatever it was, occupied a position each of the arch, as the doorway to the left clearly shows. It is now set upon a dwarf wall, and looks unusually well. The font to this church is an exceedingly fine one, with sculptures representing the Seven Sacraments of the Church, the Crucifixion filling the remaining compartment of the octagon. The western tower and spire of this church are of handsome proportions, and altogether the building is of great interest. The drain-pipe like (Norman) respond shafts to the chancel-arch remind one of St. David's and similar work in Ireland, said to have been introduced from Wales. The return stalls in the chancel are partly made up, but are original, and have grandly-carved elbows. Next week we shall illustrate the font and these stalls. (Walsoken Church was illustrated in the Building News for July 10, 1885.) Wisbech Church is a large one, and has a broad, boldly built tower on the north side of later date than the church. Large and important as the building is, the architect scarcely discovers much in it of great interest. The original Norman nave was incorporated into a very wide one, but now this is divided into two, giving the effect of dual naves with three arcades, and then wide aisles beyond. The porch on the south side is picturesque (we shall give a sketch of it next week), and one of the best bits in the building is the fine door leading from the tower into the north aisle. With Leverington Church in the Diocese of Ely concluded the day's proceedings. This is close to Wisbech, and is a large, well-kept church of great beauty, chiefly remarkable for its picturesque porch and western tower and spire. The tower is Early English, and the porch is of the Late Decorated period. Charming sketches of it will be found in the Building News, May 7th and June 19th, 1885.

The outing on Tuesday commenced by a halt at Middleton Tower, a red brick moated modern residence built on to the Tudor gatehouse of the hunting castle, of which Lords Scales and Widvilles were the owners. It is nicely situated, and is interesting for its breadth of treatment and massiveness; but there is hardly anything of an architectural character beside the house, which was enlarged in 1856. East Winch Church, once restored by the late Sir Gilbert Scott, did not detain the Associationists long. It has brick-built tracery and mullions to the porch, which were plastered. The chancel roof is an instance of how the old builders knew to design a simple piece of construction in an artistic and suitable manner. The nave roof is a contrast, and exhibits how modern architects often spend money in producing pretentious pieces of expensive elaboration. Age may tone it down, but work now must be judged by its present effect. West Bilney is not worth stopping at, and Pentney, with its ruined gateway, had to be missed. In Pentney Church are some good new seatings and fittings from the designs of Mr. E. Guy Dawber, carefully carried out. Narborough Hall is of little interest; but the church contains the Spilman monuments. One in alabaster, dated 1607, in the chancel, has some reclining figures of my lord and my lady, while their baby child is perched up under a tester canopy. The detail of the work is coarse and crude. There is a good brass on the sacrarium wall, and indications on part of it which suggest its connection with an Easter sepulchre, the Resurrection being rather well engraved on a shield above the portrait figures North of the nave is an arcade of three bays of excellent proportions and mouldings. This was the first faced-flint built church seen on this excursion not plastered.

Castle Acre, on the banks of the Nar, is very well known, of course, for its famous ruins of the great Priory for Cluniac Monks, which the first Earl Warrenne originally founded within his castle here; but the second earl removed the monastery to the west end of the village, to the site where the present walls are standing. It must have had a noble church, and the existing west front is sufficient to show its great beauty of detail for Early Norman work, and also indicates its vast proportions. Space prevents us from entering here on the history of either the priory or castle, which have frequently been described. The church is a gaunt, flint church, chiefly Perpendicular in style, and has lofty aisles and a bold clerestory. The lower part of its old rood-screen remains with figure paintings and powderings of monograms and flowers to the panelling. Part of the screen door is reused in a prayer-desk, and the pulpit, which has been restored, is elaborated with similar paintings of saints and other figures. The old and new return stalls occupy the choir, and the staircase to the rood-loft is perfect. The font-cover is a very tall traceried and pinnacled structure of the 14th-century date, gilded and coloured like some to be seen in East Norfolk. The roofs are poor, but the windows contain fragments of old glass. The vestry once had a priest's room over it, with openings which commanded the high altar and the nave. The floor has been removed, but the corbels and the joists remain. We give a view of the hospital or almshouses at Castle Acre, where the old mantel and furniture which we illustrated last week came from.

Swaffham has a truly grand church, most picturesquely situated with regard to the high street, making a charming subject for an architectural water-colour. The chief interest here undoubtedly is the magnificent roof over the nave, constructed with double hammer-beams, which have wall-posts brought down almost to the sills of the clerestory windows, thus enhancing the effect of the interior, and adding apparent thickness to the reveals of their openings. Each compartment is decorated with carved angels, and the deep cornice to the walls is very rich indeed. Mr. W. O. Milne recently repaired this roof, and is to be congratulated upon the manner in which the work has been done. Nothing could be better, and every care seems to have been taken. The stalls in the choir are particularly worth noting, especially the female figures to the ends of the priests' reading-pew fronts. They are represented seated in pews at their devotions, with the rosary suspended over the front. The pose of these figures is admirable.

Two hours were well spent at Oxburgh Hall, which is a great brick house with a moat all round it, and having a splendid gate, wall tower with octagonal turrets flanking the bridge, divided into many stages by courses of corbelling in red terracotta, giving a Flemish character, and reminding one of Layer Marney in Essex, which was erected in 1520-3, by the first Lord Marney, Captain of the Guard to Henry VIII. Sir Richard Paston Bedingfield is the present owner of Oxburgh Hall, and the place has been in his family more or less since the days of Edward IV. The Bedingfields settled at first in Suffolk, but in the fourteenth century they divided into two branches: James, second son of Sir Peter Bedingfield, being ancestor of the Bedingfields of Ditchingham; his brother, Sir Thomas, of the Oxburgh Bedingfields. Oxburgh came to the family by the marriage of Edmund Bedingfield, of Bedingfield, to Margaret, sister and sole heir of Sir Thomas Tuddenham, in the reign of Henry V. Their grandson, Sir Edmund,

was the builder of Oxburgh. Dallaway (Notes to Walpole) suggests that the moulded brickwork at Layer Marney was executed under the direction of Girolamo da Trevizi, the king's architect. Probably both Layer Marney and Oxburgh were designed by the same hand, or possibly the workmen from Flanders who built the one may have been engaged on the other. Certain it is that the grand terracotta tombs in the church at Oxburgh to the Bedingfields are almost identical in style and detail to the tomb between the chancel and the aisle in Layer Marney Church to Sir Henry, first Lord Marney, who died in 1523 (see BUILDING NEWS, April 2nd, 1886), and they correspond very closely with the Renaissance terracotta work usually called a sedilia on the north chancel wall of Wymondham church, also in Norfolk. The canopy work in all three examples is nearly identical, and the work in each case is of exquisite beauty. The hall at Oxburgh was destroyed in the last century, and so the buildings at present only occupy three sides of the quadrangle, though a few years ago Mr. J. C. Buckler added a connecting corridor between the two wings; but this, like the rest of his work here, is most incongruous with the old and quite out of scale with it; the billiard-room window in the court-yard being lumpy and ugly to a degree. The Gate-house Tower is the chief thing to see for the architect, and we may say that in its way nothing could be nicer. We particularly admire the semi-octagonial bay windows, which run up after the fashion of turrets on the inner front of the tower in an unusual manner, giving great breadth. Outside, the big angle towers make the gateway look a trifle pinched, and the pointed arches in the wall over the Tudor-headed windows to the first floor are curious. The tapestry in the King's Chamber, worked by Mary Queen of Scots, and lately shown at the Stuart Exhibition, is most interesting, and so is the old Jacobean bed and spinning-chair, the panellings and other fitments in the tower. The hiding-place for the priests is shown, for the Bedingfields have always been Roman Catholics. In the grounds is an ugly chapel, designed by Pugin; but it contains a very handsome Flemish triptych over the altar, and a table of the same date. The colouring inside the chapel shows what to avoid; but there is a fine marble monment in the mortuary aisle, with a recumbent figure of the late owner and builder of the chapel. In the house are many paintings of much interest, by Holbein, Vandyck, and others. The church at Oxburgh has a lofty and elegant tower and spire at the west end. The interior is large and ill-cared for, kept as bald as it can be, considering the beauty of the architecture. The noble old eagle brass lectern is turned round and incorporated with the three-decker arrangement, the pulpit and other parts being done in common deal. The high altar is about 2ft. 6in. long, and there is nothing in the chancel but two family pews! The tombs already named are the things to see, and they are grimed up with whitewash, which is fortunate in one way, because it serves to preserve their exquisite detail. Some day things may change, and the place may be properly renovated and repaired. Stoke Ferry is the nearest railway station, about two miles away. Thus concluded Tuesday's trip, and here we must leave our notes for the present. Next week we will give more, with further illustrations. Among those printed to-day are some sheets by Mr. Guy Dawber of old Timber Houses in Bridge-street, King's Lynn; the lectern and altar-table from St. Nicholas, of which church Mr. Arnold B. Mitchell's sketch of the great south porch is interesting, and also he gives some stall ends from St. Margaret's and St. Nicholas choirs. The hooded doorways on the north side of this last-named grand church are interesting. We give a sketch of one to-day, and also some notes from King's Lynn Museum and the Guildhall. The interior of the Chapel of Our Lady of the Red Mount at Lynn, and the plan and section on the same plate, should be studied in conjunction with the monograph which we gave of the building in our pages for Dec. 29, 1882. We gave the Organ Front at St. Margaret's last week, and next week we shall give a view of the Custom House. Snettisham Church was seen on Thursday.

A NEW SUBSTITUTE FOR GLASS.

THE introduction of a material combining all the advantages of glass with none of the corresponding disadvantages arising from its brittleness will be hailed with interest by every class of the public, who suffer daily in one form or another from the fragile nature of the article it is now sought to supersede. The transparent wire-wove roofing, which is translucent, pliable as leather, and unbreakable, has for its basis a web of fine iron wire, with warp and weft threads about one-twelfth of an inch apart. This netting is covered on both sides with a thick translucent varnish, containing a large percentage of linseed oil. The process of manufacture is conducted by dipping the sheets into deep tanks containing the composition until the required thickness is obtained; the sheets are then dried in a heated chamber, and after being stored for some time till thoroughly set, are ready for use. The sheets can be made any colour desired, and range from amber to pale brown. The roofing is very pliable; and bending backwards and forwards without any injury, readily adapts itself to curves or angles in roofing. The new material is not only waterproof, but is unaffected by steam, the heat of the sun, frost, hail, rain, or, indeed, atmospheric changes of any kind. Being a non-conductor, buildings, winter gardens, and similar structures remain cool in summer and warm in winter. Owing to its lightness as compared with glass—only ½lb. per square foot—considerable economy in the iron or timber framing designed to carry it can be secured, whilst saving in carriage is obtained in addition to safety.

Turning now to the question of cost. Wire-wove roofing is more expensive in first cost than ordinary glass; but the many advantages, both in erection and maintenance, already set forth will, in the opinion of those interested in the question, more than counterbalance the primary additional outlay. A material that requires no glazing, can be cut with scissors and fixed with zinc nails, is an economical one to erect. For churches, passages, staircases, special coloured varieties to simulate glass similarly prepared are manufactured. Both the Admiralty and the War Office have availed themselves of the advantages to be derived from the employment of the new roofing material; whilst it may be added that the Royal Aquarium at Westminster is entirely covered with it.

A list of the many and varied uses to which the wire-wove roofing may be applied would be a long one; amongst others may be mentioned: Roofs of cotton mills, explosive and other factories, workshops of all classes, breweries, printing works, railway stations, exhibitions, cricket pavilions, lawn-tennis courts, verandahs, porches and covered ways, boathouses, engine-room skylights, conservatories, ferneries, garden frames and summerhouses, kiosks, stables, loose boxes for horses and cattle, barns, cowhouses and shepherds' houses, pheasantries, poultry runs, fowl houses and kennels, skylights, markets, schools, laundries, portable buildings, temporary structures, hospital and military huts, and all other buildings requiring to be light and dry.

ST. MICHAEL'S TOWER, COVENTRY, AND THE BELLS.

MR. JOHN O. SCOTT, F.S.A., recently restored the great tower of St. Michael's Church at Coventry, and lately there has been some discussion as to whether it would be safe to rehang the heavy peal of bells formerly placed in this tower. The question was referred by the Restoration Committee to the Committee of Architects of the Incorporated Church Building Society. Five members of this latter body, consisting of Messrs. Ewan Christian, Wm. White, J. P. Seddon, R. H. Carpenter, and J. Brooks, went to Coventry and inspected the tower, in consequence of which, with the exception of Mr. Christian, they report unfavourably, and gave an emphatic opinion against so altering the tower as to make it accommodate more bells than it was ever intended to hold. As far as we are able to judge, no doubt this view is the right one, and we agree that it is undesirable that the authentic design of one of the finest towers in England should be thus interfered with merely, as the referees say, for the purpose of ringing a peal of bells, the hanging of which within its walls the original designers, it is quite certain, could never have contemplated. Mr. Christian, in a rider added to the report, says, however:

I dissent from the archæological view expressed in the last clause of the foregoing report, in the belief that the additions proposed, if properly designed and carried out, would in no respect injure the general design of the tower, but would rather improve it by adding solidity to the base, in which, both in a constructive and architectural sense, it is at present deficient.

I also think that the execution of such works for a desirable object would be quite in accordance with mediæval principles and practice.

I may add that Mr. Pearson agrees with my views in this matter, but that, not being a member of the sub-committee, and consequently not having signed the report, he cannot either sign this qualifying note.

EWAN CHRISTIAN.

This expression of dissent has brought forth the following protest from the remainder of the sub-committee, and it is addressed to the Restoration Committee:

The last clause of the Report of the Sub-Committee of the Honorary Architects of the Incorporated Church Building Society, being, as stated therein, one in which they were not unanimous, the dissentient member Mr. Ewan Christian—in returning the report to the Rev. Mr. Blakiston (to whom it was addressed), thought it incumbent on him to state the reasons of his disagreement, and on a separate sheet sent as a rider an explanation of them. We have therefore thought it incumbent on us also, as the majority, to state more fully than was possible in the concluding clause our reasons for maintaining the tower unaltered.

We consider that the additions, conditionally suggested, howsoever designed and carried out, would injure the general design of the tower, and, indeed, completely change its almost unique character, standing as it does at the west end of the church on four arches, after the usual type of a central tower, but with three sides exposed and filled in with windows; the north and south sides, equally with the west front, are extremely beautiful, and with ample solidity for the original purpose, which was not to hold such a heavy peal of bells as the present.

We do not consider it would be a "desirable object" to so convert it into a bell tower for ringing a heavy peal; and though the altering of an earlier design was frequently the practice with Mediæval architects, we entirely dissent from the implication that any such practice of theirs would justify us in destroying the essential characteristics of their work.

For these "archæological" reasons we are strongly opposed to so great a change in the design of this tower as would be involved by the alteration above referred to.

Looking at the subject also from the architectural point of view, we are of opinion that the substitution of a solid wall and buttress for the side windows of the ground story would destroy the balance of parts, and render necessary other alterations above, so that it is difficult to say where the requisite modifications should cease.

We are, gentlemen, yours faithfully,

JAMES BROOKS,
R. HERBERT CARPENTER,
WILLIAM WHITE,
JOHN P. SEDDON.

A townsman, as an alternative, has offered, we are told, to present a large sum of money for the erection of a campanile to hold the bells, and it would be certainly a thousand pities to risk the safety of the tower of St. Michael's, or alter it, as Mr. Christian seems to advise. We should have been glad to hear Mr. J. O. Scott's opinion as architect to the church.

CHIPS.

The foundation-stone of a mission building connected with St. Saviour's Church, Leeds, was laid in Upper Accommodation-road in that town on Saturday. The building will provide a crèche, washhouse, baths, and an invalid kitchen, in addition to an assembly hall, 60ft. by 24ft. The architects are Messrs. Kelly and Birchall, of Leeds, and the contractor is Mr. William Evans; about £2,100 is the estimated cost.

Colinton Episcopal Church, Edinburgh, built from designs by Dr. Rowand Anderson, was opened on Saturday by Bishop Dowden. Built in the 15th-century Gothic style, the edifice consists of a nave 20ft. by 25ft., a chancel 20ft. long, and a tower 15ft. square. Only the lower part of the tower, which is used as a vestry, is completed. In the nave are placed open pews, stained, and the whole interior is panelled up to the window-sills. Red tiles have been used for the roof outside. Accommodation has been provided in the building for 200 people. Dr. and Mrs. Rowand Anderson contributed largely to the furnishings.

A commencement has just been made with the Library Buildings for the Supreme Court of Solicitors at Edinburgh, which will cost about £26,000, including £7,400 expended on the purchase of site. Mr. James B. Dunn, of George-street, Edinburgh, whose design was selected in competition, and was illustrated in the BUILDING NEWS for Aug. 10, 1888, is the architect, and Mr. Frank Bell is the clerk of works. Messrs. W. and D. McGregor are the chief contractors.

Mr. William Crutchley, of Wakefield, has been appointed by the West Riding County Council main road inspector for the south-western district of the county, in the stead of Mr. John Farrer, resigned. The salary is £165 per annum.

A new gateway (No. 3) leading into the Hudson Dock on the river Wear was formally opened on Monday. It has been constructed under the direction of Mr. H. H. Wake, engineer to the Wear Commissioners.

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NEW OFFICES OF THE SOUTHWARK AND VAUXHALL WATER COMPANY.—CHURCH OF ST. SWITHUN, HITHER GREEN.—ARCHITECTURAL EXCURSION SKETCHES.

OUR LITHOGRAPHIC ILLUSTRATIONS.

NEW OFFICES OF THE SOUTHWARK AND VAUXHALL WATER COMPANY.

The loan of a drawing by Mr. Restler enables us to give an illustration of this building, which has just been erected in the Southwark Bridge-road upon a portion of Messrs. Potts' vinegar works. The façade is carried out in Portland stone, and the internal fittings and staircase are executed in Spanish mahogany. The cupola shown in the view has not been carried out, as it is in contemplation that a fourth story is to be added in the future, the lead flat and girder construction having been prepared with this view. Messrs. Holloway Brothers, of Battersea, were the contractors for the building and internal fittings, at an outlay of £11,166; Messrs. Jenks and Wood, of Berners-street, supplied the furniture and office fittings; Messrs. Stutter and Co. the electric lighting; the two lifts by the American Elevator Company and Messrs. Stannah and Co. The building has been designed and carried out under the superintendence of the engineer to the company, Mr. J. W. Restler.

ST. SWITHUN'S, HITHER GREEN.

This church is shortly to be built at Lewisham. The nature of the site has dominated the scheme of arrangement, as it is curtailed by building frontages, &c., on all four sides. The land slopes considerably from west to east, and the vestries, &c., are placed under the chancel and chapel. The plan given with our views illustrates the internal proportions and fittings. Mr. Ernest Newton is the architect.

ARCHITECTURAL ASSOCIATION EXCURSION SKETCHES.

For description, see page 212.

The foundation stone of a Wesleyan Sunday school now in course of erection in Roundhay-road, Leeds, was laid on Friday. A chapel will hereafter be built adjoining the school, at a cost of about £6,700. The schools, which are in progress from designs by Mr. G. F. Danby, of Leeds, are being built of red pressed bricks, with Harehills stone dressings, in the Italian style, and comprise an assembly-room, 60ft. by 34ft., lighted by clerestory windows over the side class-rooms, and windows at each end. This room will have an open lantern roof with recessed platform at one end. On both sides of the assembly-room are ten class-rooms of various sizes. Two of these can be opened into one apartment, 20ft. by 18ft. At one end an infants' room, for 180 scholars, with class-room and separate entrance, is provided. The cost of the present erections will be about £2,000, and the works are being carried out by Messrs. W. Thompson and Sons and Messrs. Cross and Carter.

An ornamental pillar-lamp and fountain are about to be erected in the Market-place at Jedburgh as a tardily realised memorial of the Jubilee. Mr. Bell, of Glasgow, is the architect.

A buried city, containing relics in profusion, has been unearthed in Honduras.

COMPETITIONS.

Cleckheaton Town Hall.—The *Leeds Mercury* says:—"The Town Hall Committee have cancelled their decision to submit the competitive plans provisionally adopted to an eminent architect for his opinion as to whether or not the plans could be carried out at the estimated cost of £7,543; and the architects under the *nom de plume* of 'Light and Air,' the authors of the plans in question, have given an undertaking to obtain tenders for the work within the sum specified, or bear the cost of getting out the necessary specifications, quantities, &c., and, if called upon, to withdraw from the competition. The five unsuccessful competitors have issued a circular, in which they allege unfair treatment at the hands of the Town Hall Committee. The circular states that the selected plans do not comply with the conditions required by the committee."

Leeds.—At a meeting of the Leeds Infirmary Board held on Friday, Sir Douglas Galton, K.C.B., who had been invited to assist the board in the selection of an architect and in the adjudication of prizes in connection with the infirmary extension, gave his report. In accordance with that report, the board appointed Mr. George Corson, of Leeds, who had sent in a plan under the motto "Lochinvar," as the architect, and awarded him the first prize. They gave the second prize to Mr. W. H. Thorp, also of Leeds ("Medical Student"), and the third to Mr. W. Bakewell ("Machaon"). In the adopted design the front of the new pavilion wing will be in a line with the main front of the present building. The new erection will be generally in keeping with the present building, and the communication between the two will be obtained by extensions of the present corridors on the existing level. The new pavilion wards follow very much in their detail the present ones. The administration block will have on each floor a nurses' room, a room for special cases, a bath-room, and conveniences for the small ward. The large waiting-room is 89ft. by 72ft., and is entered from the north side by a covered carriage porch. The north side of the waiting-room is occupied by the surgeons' and the eye and ear departments, the patients' entrance being between these. The south side contains the physicians' and the obstetric departments, while the east end has the isolation-room, the lavatories and the separate stairs for men and women to their baths in the entresol. An alternative arrangement of this part is also shown. The estimated cost of the new building is £17,000. The walls will be of brick, faced with pressed brick, and dressed with Bolton Wood stone. The roofs will be constructed of Memel timber, and covered with 2in. boarding and dark Westmoreland slates. The floors of the wards will be laid with oak boards, and those of the waiting-rooms with solid herring-bone oak flooring. The waiting-room will be ceiled with pitch-pine. The walls of the bath-rooms and lavatories, the isolation-room, and the isolation wing will be lined with glazed bricks of cream colour, and the waiting-rooms and corridors will be lined to the height of 6ft., and will have a base and a surface of moulded or glazed terracotta.

Owen Jones Prizes.—This year's competition for the six prizes offered by the Council of the Society of Arts as trustees of the Owen Jones Memorial Fund has just been decided. The successful competitors, who each receive a bound copy of Jones's "Principles of Design" and a bronze medal, are—Maggie Strang, School of Art, Glasgow—design for surface decoration; Mary K. Curtis, School of Art, Canterbury—design for damask; Lizzie Girvan, School of Art, Glasgow—design for wall-paper; Arthur M. Pearson, School of Art, Cavendish-street, Manchester—design for the decoration of a room; William H. Pegg, School of Art, Nottingham—design for lace curtains, &c.; Ellen Robinson, School of Art, Scarborough—design for tiles.

The committee for the restoration of the church tower at Ludlow have signed the contract for the work of restoration to be done, and it will be commenced almost at once. The scaffolding that will be used will be the same that was used at St. Michael's Church, Coventry. The committee have also accepted the estimate from Messrs. John Taylor and Co., of Loughborough, for a new treble bell, clappers, fittings for the bells, and framework in the belfry, and an improved Ellacombe chiming apparatus, the total cost being £309 4s.

Engineering Notes.

City and Southwark Subway.—But little has been heard of late, or is to be seen above ground, of the City of London and Southwark Subway, of which we gave a detailed description in February, 1887 (p. 266—7, Vol. LII.) At the tenth half-yearly meeting on Tuesday, the chairman announced that the whole of the tunnels forming the subway were finished, with the exception of a small piece about 250 yards long, between the Oval and the terminus at Stockwell. This was a piece of wet gravel, and apparently there was no practical difficulty in getting through it beyond the question of time. All the underground works for three of the stations were finished, and the works at the other three stations were proceeding very rapidly. In about eight weeks from now they hoped that the whole of the stations would be completed. They had also commenced the erection of two of the surface stations—at Great Dover-street and the Elephant and Castle. The surface station at King William-street was already standing—the buildings were there, and the lower part was now being altered into the permanent station. The permanent rails were laid almost the entire length of one tunnel and part of the length of the other between King William-street and the Elephant and Castle, and the line would be opened, he cautiously intimated in answer to questions, "within a reasonable time." The chief engineer is Mr. J. H. Greathead, M.Inst.C.E. Mr. Edmund Gabbett, of Liverpool, is the contractor for the subway, Mr. E. Jones being his acting manager. Mr. T. P. Figgis is the architect of the stations.

CHIPS.

The town council of South Shields have decided to build a new police court and station on the Phœnix Glass Works site and the land purchased from the Post Office authorities, the sum to be expended not to exceed £10,000. It was resolved that a premium of £50 be offered for the design considered by the corporation to be first in order of merit, and that further premiums of £30 and £20 be given to the two next approved designs.

A group of casual wards, stables, and other buildings are about to be added to the workhouse at Eastbourne, at a cost of about £2,000. Mr. F. G. Cooke, of London and Eastbourne, is the architect, and Mr. G. Coster, of the latter town, the builder.

The statuary hall of the National Wallace Monument, on the Abbey Craig at Stirling, has received an addition in the shape of a bust by Mr. D. W. Stevenson, R.S.A., Edinburgh, of the Rev. Dr. Chalmers.

A stained-glass memorial window has been presented to the parish church at Acock's Green, Birmingham. It consists of three lights and tracery. The former illustrates Agur's prayer, and in the latter is a figure representing Charity, with lilies in the cusps of the cinquefoil. The window has been carried out by Messrs. Winfield (Limited), of Birmingham and London, successors to Camm Brothers, of Smethwick.

At the Dean of Guild Court, Glasgow, on Friday, before Dean of Guild Walls, John Porter, builder, Dalmarnock-road, Glasgow, was charged with commencing to erect buildings in Dalmarnock-road without authority from the Dean of Guild Court, and also with erecting dwelling-houses in the same road otherwise than in conformity with the plans passed at that court. The Lord Dean of Guild remarked that as Mr. Porter had been previously warned he was evidently setting the court at defiance. He imposed a fine of £20 for the first offence, and £50 for the second offence.

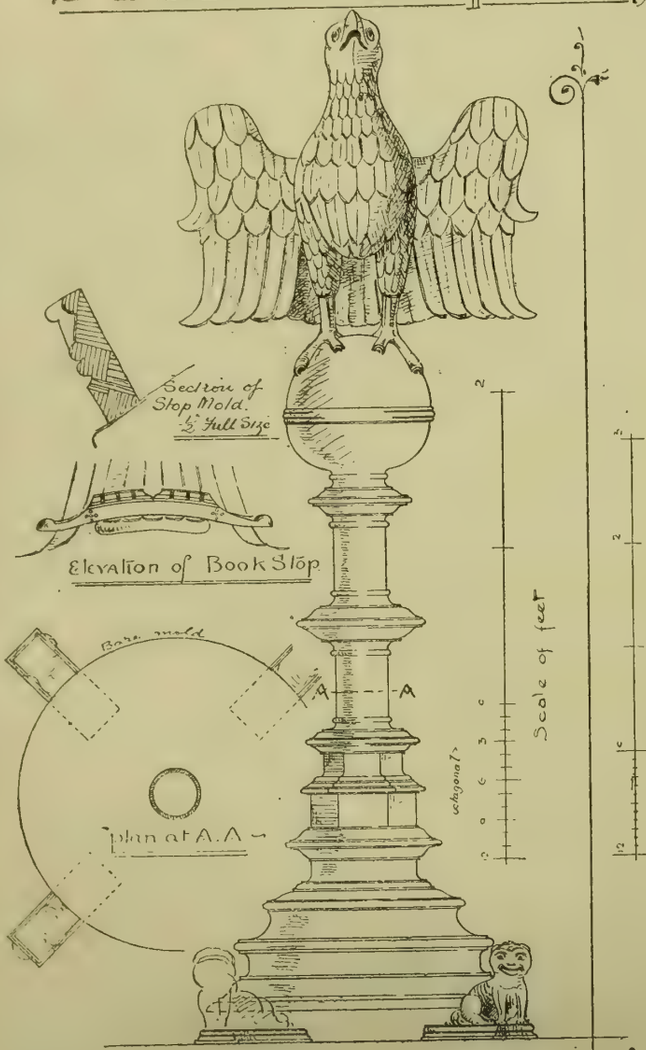
The town council of Walsall decided, on Tuesday, to offer a salary of £350 a year, to be afterwards increased to £400, to the borough surveyor about to be elected in place of Mr. Hardwick, resigned through ill-health. At the same meeting Mr. W. C. Bryning, of Bootle, was appointed assistant borough surveyor.

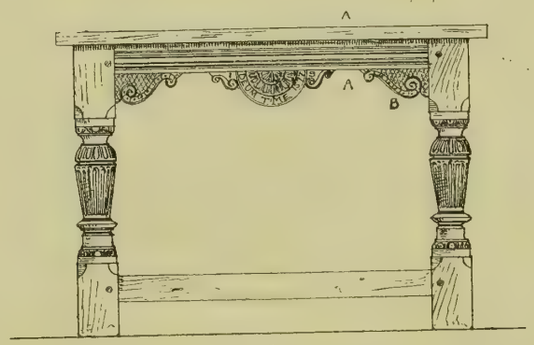
On Monday night Mr. J. L. Toole opened a new theatre, which has been erected by the Buxton Gardens Company in connection with the Pavilion. The building, which is Classic in design, will accommodate 800 persons, and has cost nearly £4,000. The architect is Mr. W. R. Bryden, of Buxton, and the contractor Mr. J. Salt, of the same town.

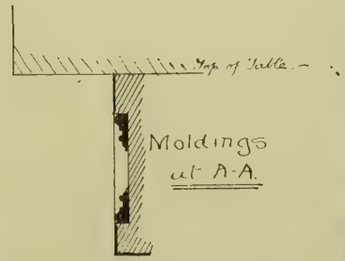
The long-projected promenade pier at Dover is about to be commened. It will consist of a structure 900ft. long by 40ft. wide, having a timber deck carried on wrought-iron girders supported by cast-iron piles. At the seaward end will be a pavilion and timber landing-stage. Mr. John J. Webster, of Lord-street, Liverpool, is the engineer.

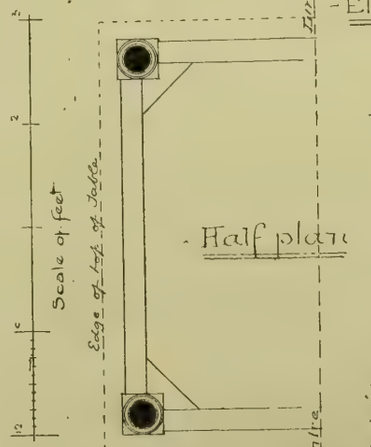
St. Nicholas Chapel - Lynn. Lectern and Table - Details

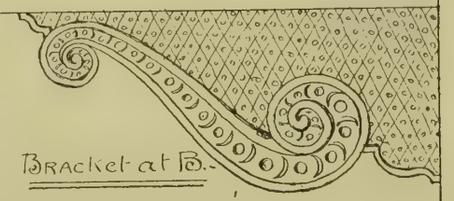
ARCHITECTURAL ASSOCIATION EXCURSION 1889





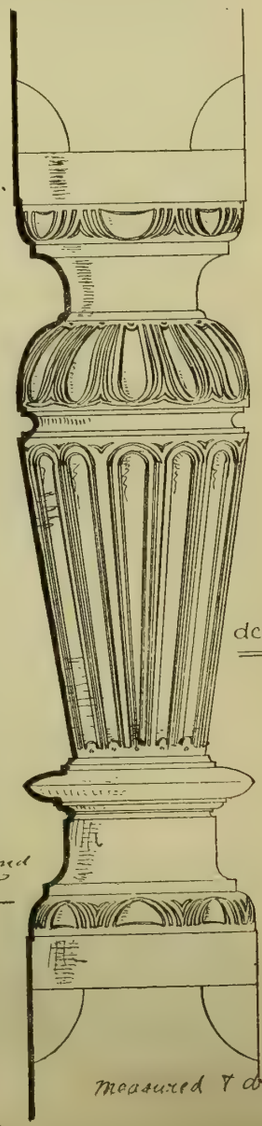






The centre ornament is only on the front and back of table. — "Regem Honor" is cut on the back one. Also the moldings at A.A. do not run round.





Measured & drawn.
G.D.

Old House, Bridge Steet
Kings Lynn

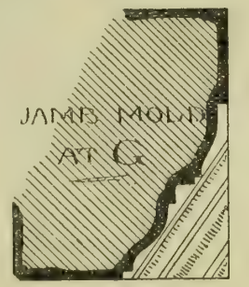


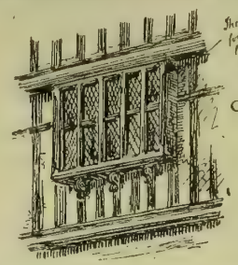


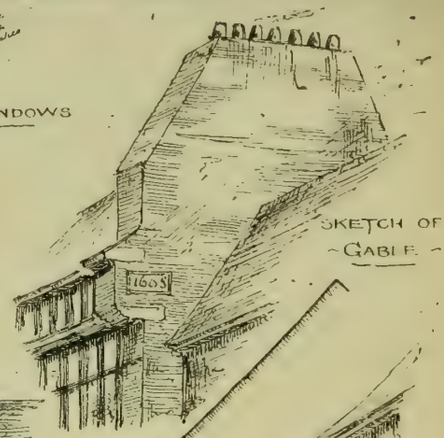


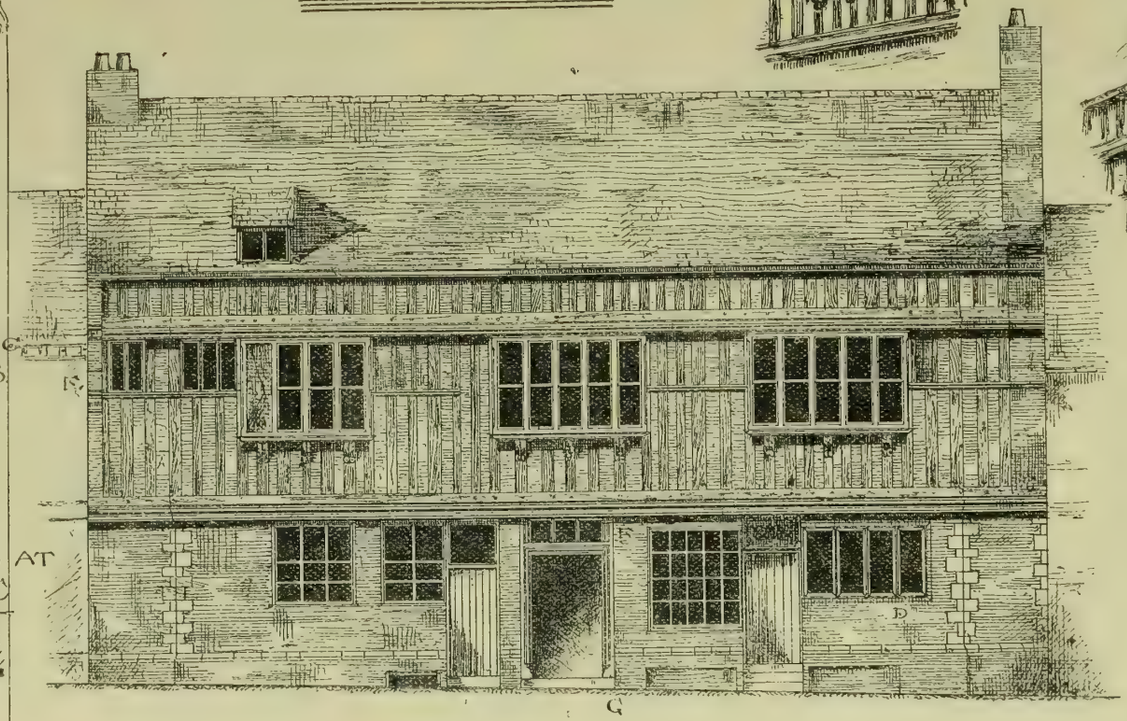




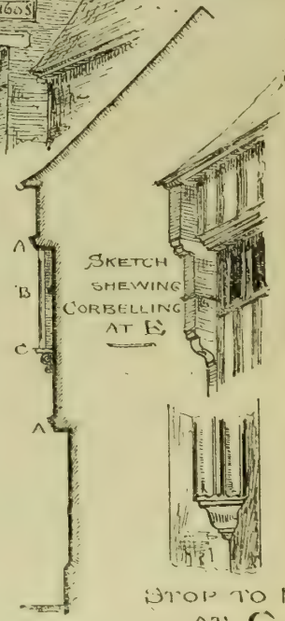








ELEVATION



SECTION

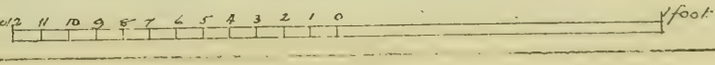
ARCHITECTURAL ASSOCIATION EXCURSION 1889



PLAN



SCALE TO ELEVATIONS.



SCALE TO DETAILS.

Measured and drawn.

E. Guy Dawber.

WAYSIDE NOTES.

THE formal opening of the New Natural History Museum at Vienna duly came off last Saturday, the Austrian Emperor, attended by many dignitaries of State and Court, being present. For some years past the architectural world has been kept alive to the interest that would attach to the completion of this building. From time to time reports have got abroad as to its magnificence; and the occasional articles and lectures on the architectural development of Vienna have awakened curiosity about it. According to all reports it is one of the finest buildings in the world-renowned Ring Strasse. This is saying a good deal, for the Ring Strasse is gemmed with palatial edifices. I note that the building is described in my particular daily as having been erected "in the Italian Renaissance style, with modifications after the Viennese fashion." This description will not convey much idea of architectural grandeur to the ordinary intelligence; but the public will appreciate the fact that the building covers about 11,000 square mètres, and that it possesses an "immense cupola" surmounted by "a colossal brazen statue of Helios," with a dedication in letters of gold along its chief façade, while thirty-four statues of eminent naturalists are posed upon the balustrades. Furthermore, they will respect the grand marble staircase, the elaborate ceilings, and frescoed cupola painted by a deceased Vienna artist. These "points" should earn for Baron Hasenauer considerable renown among lay critics.

Professional opinion will, however, give much credit to the late Herr Semper, who had a hand in the conception of the Vienna Museums. Gottfried Semper is a name that should, and will, be handed down to posterity amongst architects not only on the Continent, but in this country. The Vienna Museum is one of the finest buildings with which his name is connected. Those desirous of becoming acquainted with the type of architecture employed in this building may do so by procuring a copy of Messrs. Hock and English's "Academy Architecture" for 1889, the first issue of what promises to be a very interesting and useful publication. Herein is represented the "Imperial Court Museum, Vienna." An elevation of centre portion, which shows the "brazen statue of Helios" and the "letters of gold," and an elevation of side wing are given, besides a general view taken from a photograph, and illustrations of many of the exceedingly beautiful spandrel figures. From these drawings one may see the style employed in this building, which, if not vastly original, is yet beautiful, and always pleasing.

I like the term, employed by the *Standard* correspondent, "Italian Renaissance, with modifications after the Viennese fashion." It is well that a great, and, for the matter of that, a small, city, should have something in its modern architectural aspect that takes it out of the rut of the commonplace. We know what is meant by "Italian Renaissance, with modifications after the Viennese fashion," and so we should by "Italian Renaissance, with modifications after the Parisian—or Brussels—fashions." I much question, however, whether the expression, "Italian Renaissance, with modifications after the London fashion," would convey much that was clear and intelligible even to the mind of the London architect. There are so many "modifications," from the most rabid Queen Anne, to the most severely Classic. This is rather a pity, as individuality in the architecture of different cities is as charming as it is in the works of different architects. In the latter respect, however, we can hold our own in this country against any other in the world. I do not know of any other country except England where personal individuality has been so developed as to cause us to speak of the "Norman Shaw style," the "Ernest George style," or even, as you write in your report of the Harringay Board School competition, of the *Board School style*.

Like the newly-arrived Irishman and the American Government, I am "agin" any form of competition wherein an endeavour is made to suck an architect's brains for elevations and to refuse him the job of planning, designing, and carrying out the works. I am, therefore, strongly opposed to the competition announced from Hertford for an elevation for a post-office. The elevation is to be adapted to "plans already arranged with the Postmaster-General's Department." In consideration of this invitation the profession ought to politely request the Trustees of the Hertford Poor's Estates to design their own elevations. This is what it *ought* to do, though we know it will not. There will be plenty of competitors who wouldn't like it generally talked about, that they had competed for £25 and been content to be considered mere elevation designers. But I am sorry to see it; I am sorry, likewise, to see that architects will design elevations and be content to allow presumptuous clerks of works to set themselves up as the practical architects. I am sorry to see hotels and other extensive buildings rising on this system in London; and it will be a cause for certain future regret if the profession does not, to a man, do each his utmost to stamp out any signs of its adoption as soon as they first make their appearance. So much for this Hertfordshire competition.

There is a great lack of advanced technical handbooks, both on matters relating to architecture and to engineering We have not in this country anything to correspond to what is to be found on the Continent. Take Germany, in general, for instance, and the *Deutsche Bautechnische Taschenbibliothek*, published by a Leipzig house, in particular. The engineering student, however, is about to have something done for him in this way. Messrs. Rivington or about to publish some textbooks on practical engineering, such as railways, canals, docks, &c., the excellence of which is assured by the fact that their general editorship will be under the author of the "Notes on Building Construction," a work that the architectural pupil cannot be too indebted for, and which the architect himself at times carries up his sleeve when he thinks he is going to encounter an exceptionally practical client.

Touching the rumoured proposal to demolish the city church of St. Edmund the King and Martyr and St. Mary Acons, the curate in charge writes to the *Athenæum*, and gives some interesting particulars. According to his account, the proposal to pull down the church came from certain "busybodies" in a neighbouring parish. The Bishop of London has appointed a commission to inquire into the whole matter, and, although this committee have not, or had not at that date, issued any report, it is believed that they will give a verdict in favour of the retention of the building. Considering the nature of the Commission, one might safely wager "all Lombard-street to a china orange" that this will be so. It is thought, however, that they may recommend the destruction of the little Church of All Hallows, hard by St. Edmund the King. Seeing that All Hallows represents three other parishes besides its own—viz., Gracechurch, Eastcheap, and Backchurch, it ought to have some claim to live on. As a representative of what I suppose were four Mediæval buildings, it possesses no little interest. However, be the report of the Bishop of London what it may, the curate of St. Edmund the King asserts that the ultimate fate of either building rests with those in charge of them, the congregation, parishioners, and ratepayers. An extensive petition has been signed against the destruction of St. Edmund. A few days back, passing down Lombard-street, I took a more careful survey of the church, and find that the carved woodwork is of great interest. It is evidently the work of Gibbons, from Wren's designs, the pulpit especially being a beautiful specimen of the style. Formerly there were elaborately-carved pews; but now benches are substituted. Some of the old carved wood, however, is apparentlyworked up to form the choir stalls, &c.

The county of Norfolk, always charming to the architect and archæologist, appears likely to be pretty well "done" this holiday season, what with the rambles on its western borders of the Association, and the wanderings of the Royal Archæological Institute in its eastern district. The Association could not well choose a happier hunting-ground than the Fens, and the only wonder is how its members are going to get through the programme in the time allowed, so rich is it in those old buildings dear to the heart of the sketcher. Your announcement that you will be giving a series of plates contributed by the gentlemen named will be sufficient to make your readers look forward with more than ordinary interest to the next few numbers of the "B. N." You start well with Mr. Dawber's sketches of the delightful furniture at Castle Rising Almshouses, and the names of Arnold B. Mitchell, A. Needham Wilson, and W. Harold Oakley, coupled with that of E. Guy Dawber, go to form as powerful an array of architectural sketchers as the generation has witnessed. There is this much to be said for the holiday tours of a body like the Association: we do get some benefit from the labours of those joining in the tour, whereas there is nothing tangible comes of the outings of the archæological societies. Interspersed among the "Old bucks" there are, of course, several earnest students; but, accompanied as they are by men sightseers, they are not in a position to do any serious sketching. Little good will be done by the societies that visited Lincoln and Norwich; but from the labours of the members of our own excellent "A.A." we may all derive some benefit. N.B.—No one leaves town without first leaving directions to have his BUILDING NEWS forwarded, so please will the gentlemen mentioned above consider this paragraph as intended to show that their labours are appreciated to the full, and so, in consideration thereof, put in a few extra hours' sketching on the last day of their visit to the Fens?

Your correspondents Messrs. Longmire may rest assured that *nothing* in the St. Alban's Abbey controversy has escaped my attention, not even the way in which they are prone to round on me in preference to any other contributor to the discussion of this subject. As to who talks nonsense, that is a question for the reader to decide. I fail to see how the "ancient painted ceiling" affects the main issue of the discussion. The point between Messrs. Longmire and myself is the alleged inaccuracies in the "Sheet of Contrasts," and as I had been content to say nothing on this score till I had seen the latest works at the Abbey, one would only have expected that your correspondents would have, on their part, left the subject alone until I had had an opportunity to get to St. Alban's. If not inclined to do so, all I ask is that they shall "absolutely prove" what they have stated—not to me—I am content for the time to be ignored—but to the readers of the BUILDING NEWS, who, doubtless, will be interested in knowing in what way the proof will be made.

GOTH.

CHIPS.

The Vicary memorial pulpit in Warminster parish church was dedicated on Sunday week. It is Decorated Gothic in character and octagonal on plan. The main portion is of yellow Balsover magnesian limestone. The lower bases and the treads of the steps are of blue Pennant stone, whilst the cornices, main plinth, and the three tiers of columns are of variegated Devonshire marble. The cants in the body of the pulpit have their lower parts filled by pierced tracery, and at the angles are angels. Sir Arthur W. Blomfield designed the pulpit, which has been executed by Mr. Harry Hems, of Exeter.

A large clock has just been erected in the parish church of Draycott, Staffordshire, by John Smith and Sons, Derby. It strikes the hours and half hours, has one dial, and will be a great boon to the village.

At a meeting of the court of the Carpenters' Company, the following gentlemen have been elected to serve for the year ensuing—viz., Master, Lieut.-Colonel Banister Fletcher, J.P., D.L., C.C.; wardens, Mr. W. Robertson, Mr. T. Robertson, and Mr. B. J. Jacob.

Canon Harvey, the nonagenarian rector of Hornsey, is to be commemorated in Gloucester Cathedral by a stained-glass window in the south choir aisle.

Alterations have been made to the Union Workhouse, Weymouth, embracing the ventilation, the extraction of the vitiated air now being effected by the latest improved form of Messrs. Robert Boyle and Son's patent self-acting air-pump ventilator.

At Monday's meeting of the Wednesbury town council, the ex-mayor, in proposing the adoption of the report of the building committee, congratulated the council on the increased building operations going on in the town, and on the prospect of the increase being maintained, trade having greatly improved. At the same time he asked the council to arm the committee with new powers in harmony with the recent orders of the Local Government Board, that the cost of connecting the house-drains with the sewers should be paid out of the rates.

CONOMICAL PROPORTIONS IN TRIANGULAR WEB GIRDERS.

FOR girders of considerable magnitude the triangular and lattice systems afford considerable advantages, inasmuch as the quantities indicated by theory can be more closely approximated in practice than is the case with plate girders. The larger a plate girder is the greater is the necessary excess of material in the web, because, with increasing depth, stronger stiffeners are required to secure the rigidity of the web, and the duty of these stiffeners is adventitious: they do not carry any part of the stress, in a structural sense, and they may therefore be looked upon, in an economic sense, as excess of material. Also, in the centre of the span, there is great waste of material in the web itself. When the triangular or lattice form of web is used, the material is aggregated together in those places where it is required, and consequently the quantity used in practice diverges less from that required by calculation.

For small spans, under 70 or 80ft., triangular girders are not more economical than plate girders, because of the difficulties which arise in making the connections between the struts and ties in the web and the main flanges, which involve the use of larger angle irons than are theoretically required, or else the introduction of more or less clumsy joint plates. The reason of this is that the transmission of the stresses from the web to the flanges is accumulated at isolated joints instead of being distributed over the whole length of the web as occurs in plate girders. In the triangular girder the web struts themselves are made to give the requisite stiffness, and thus the use of adventitious stiffeners is dispensed with, and all the web material is made available for the transmission of structural strains, and it may be observed that except on the rivets, or joint pins where they are used, all the strains are direct tension or compression, shearing being eliminated with the continuous web.

In the triangular girder all those parts in compression act as columns, and must be so treated, and when struts are connected with flanges by pins, they must be dealt with as columns with round or jointed ends. The strains which tend to cause the failure of columns are two-fold in character; first, there is the direct crushing strain, which is strictly ascertainable; secondly, and in addition to this, there is a crushing strain due to a bending moment which is not calculable. Were the centre of stress throughout the strut coincident with the centre of resistance, there would be no bending moment; but this condition is inseparable from absolute molecular uniformity of texture and figure throughout the strut, which is practically unattainable. It thus happens that the lines of pressure and resistance not coinciding, a bending moment is brought into action; but the distance at which the force producing it acts is not calculable: hence we only have the empirical data of experiment to guide us. The amount of writing, lecturing, and discussion that has been devoted to this subject is enormous, its practical utility an unknown quantity, and we still rest upon empirical formulæ, and formulæ of this class will be accepted with a confidence co-ordinate with that felt in their authors. A very convenient expression is that known as Gordon's formula, and as it has the advantage of being recommended by the late Professor Rankine—the authority, on such matters—it will be adopted here.

The struts and compression flanges are built up of angle and tee irons in combination with plates and bars, and the formula applicable to them will, therefore, be—

$$s = \frac{19}{f} \div \left\{ 1 + \frac{r^2}{900} \right\}$$

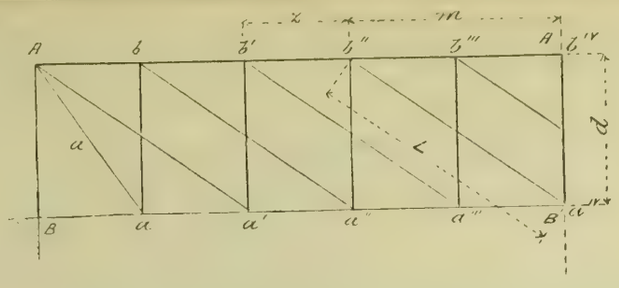
when the ends are fixed, and—

$$s' = \frac{19}{f} \div \left\{ 1 + \frac{r^2}{225} \right\}$$

when the ends are jointed; if s and s' = working stresses in tons per sectional square inch under maximum load, f = factor of safety, and r = length divided by least width of strut. For our purpose, the factor of safety may be 4; the expressions then become—

$$s = 4{\cdot}75 \div \left\{ 1 + \frac{r^2}{900} \right\}; \text{ and } s' = 4{\cdot}75 \div \left\{ 1 + \frac{r^2}{225} \right\}$$

Theoretically, the weight of web for a given span or girder is constant; hence we are at liberty so far in determining the depth of girder; but other considerations come in to impose limits



The cross girder of a bridge, bringing the load on to the main girders, must, if the stresses on the main elements are to remain purely direct, be attached to the main girders at those places where the tie, strut, and flange meet, otherwise a bending strain will be brought upon the flange in addition to the direct stress, therefore the greater the distance from joint to joint the heavier must the longitudinal bearers between the cross girders be in proportion; therefore, in deciding upon the depth of a triangular girder, the weight of the flanges must be balanced against that of the cross girders and longitudinal bearers. This is one case. Another presents itself when the load is carried continuously on the main girders themselves, as, for instance, when there is one girder under each rail of a railway bridge with the sleepers laid directly over them. We will commence with the first case, premising that, as the stresses increase by considerable increments at certain points, and not continuously throughout the length, the plates can be very closely proportioned to the calculated quantities, and, therefore, for the purposes of the present investigation, no percentage for practical excess of metal need be added, as it will be sensibly the same for all parts of the work.

In regard to the cross-girders, their weight for a given bridge may practically be taken as constant, for the weight of each one will be in inverse ratio, nearly, to the number used, unless they are placed very close together—an arrangement that will not occur in a triangular girder bridge; therefore we have only to deal with the longitudinal road girders. In order to illustrate the method of procedure, we will take for an example a triangular girder of the form shown in half elevation in the accompanying diagram. A A and B B are the top and bottom flanges respectively, between which is the arrangement of struts and ties shown, the former being placed in a vertical position, which is obviously the most economical, as the strength of a strut varies inversely with its length. The most economical distance between the struts is the point now to be determined. The cross-girders will be connected with the main girder at the points b, b', b'', &c., and the distance between these points = z will be the span of the longitudinal road girders. Assume that there are two lines of these to each main-girder, and that they are plate girders. The minimum weight of a plate girder is obtained when the sum of the sectional areas of the flanges is equal to the sectional area of the web, with an allowance for stiffeners,* and this occurs when

$$d = \sqrt{\frac{w \cdot l^2}{42{\cdot}85 \cdot s \cdot t}} = \sqrt{\frac{w \cdot z^2}{42{\cdot}85 \cdot s \cdot t}};$$

where w = load per lineal foot in tons, and l = span in feet = z, s = strain per sectional square inch of gross area of flanges, and t = thickness of web, allowing for stiffeners, in inches, d = depth in feet at centre and—in this case—throughout, as in these small girders neither the depth nor section will vary throughout the length. If the net thickness of the web be taken at ¼in., and the stiffeners are tee-irons 6in. by 3in. by ½in. thick, placed at every 4ft. on each side of the web, the value of t will be = 0·25 + (8·5 ÷ 48) = 0·427in., the sectional area—8·5sq.in.—of the tee-irons being taken as spread along 48in. of the web. Assuming that we are dealing with a railway bridge, the average weight of a train of locomotives would be about 0·8 tons per foot of rail over one longitudinal, but having regard to the concentrated nature of the loads (on the driving wheels) about three times this should be allowed on longitudinals in calculating the stresses: hence w = 2·5 tons will be taken here; then

$$d = \sqrt{\frac{2{\cdot}5 \times z^2}{42{\cdot}85 \times 4 \times 0{\cdot}427}} = \frac{z}{7{\cdot}32}, \quad s = 4 \text{ tons}.$$

The usual formula for the sectional area at the centre is $\frac{w\,z^2}{8 \cdot s \cdot d}$ for one flange; but the sectional area of the web is equal to that of the two flanges, hence the total sectional area will be $= 4 \times \frac{w \cdot z^2}{8 \cdot s \cdot d}$, and as a bar of iron 1ft. long and 1in. square weighs 3⅓lb., the weight of iron in two longitudinal girders for one bay will be $= 3{\cdot}33\dot{3}\, z \times \frac{w \cdot z^2}{s \cdot d}$; but $d = \frac{z}{7{\cdot}32}$, and the weight becomes

$$= \frac{3{\cdot}33\dot{3} \times 2{\cdot}5 \times z^2}{4} \times \frac{7{\cdot}32}{z} = 15{\cdot}25\, z^2.$$

Our next step is to determine the most economical angle for the tie-bars. Let $m = 2z$, and L = length of tie bar; then $L = \sqrt{d^2 + m^2}$, because the strut is at right-angles to the flange, and m is the distance between two consecutive struts of one series. Let the stresses on the struts and ties be 4 tons per sectional square inch of gross area. The load being equally distributed along the girder will be = $w\,z$ upon one strut, the first from the centre, and this will equal the stress as it acts directly; the area of the strut corresponding to this will be $\frac{w.z}{4}$ and the weight of one strut $= 3{\cdot}3\dot{3}\, d \times \frac{w.z}{4}$, because d = the length of the strut. The stress upon the tie will (by the principle of the parallelogram of forces) be to the load upon it as its length L is to the vertical depth d, or $= w \,.\, z \,.\, \frac{L}{d} = w z \,.\, \frac{\sqrt{d^2 + m^2}}{d}$, and the weight of a tie $= 3{\cdot}3\dot{3} \, \frac{w.z}{4} \cdot \frac{\sqrt{d^2 + m^2}}{d} \times \sqrt{d^2 + m^2}$

$$= 3{\cdot}3\dot{3} \cdot \frac{w \,.\, z \,.\, (d^2 + m^2)}{4 \,.\, d}.$$

The weight of one strut and tie together will be

$$= 0{\cdot}83\dot{3}\, w \,.\, z \,.\, d + 0{\cdot}83\dot{3} \cdot \frac{w \,.\, z\, (d^2 + m^2)}{d}$$

$$= 1{\cdot}66\dot{6}\, w \,.\, z \,.\, d + 0{\cdot}83\dot{3}\, \frac{w \,.\, z \,.\, m^2}{d}.$$

This, multiplied by the number in one series of triangles, will give the total weight for that series due to the one load $w\,z$, and the number in the series will be $\frac{l}{m}$, where l = the span of the girder; therefore the total weight of one series of triangles (in struts and ties) will be

$$= \frac{l}{m} \left\{ 1{\cdot}66\dot{6}\, w \,.\, z \,.\, d + \frac{0{\cdot}83\dot{3}\, w \,.\, z \,.\, m^2}{d} \right\}$$

Now there will be some value of d in relation to m which will correspond to a minimum weight, and in taking a number of ratios so that we pass through this value, it may be imagined that two ratios indefinitely close together will give the same weight. Let h be an infinitely small quantity, and the two values taken be d and $(d + h)$; then, upon this hypothesis—

$$\frac{l}{m} \left\{ 1{\cdot}66\dot{6}\, w \,.\, z \,.\, d + \frac{0{\cdot}83\dot{3}\, w \,.\, z \,.\, m^2}{d} \right\}$$

$$= \frac{l}{m} \cdot \left\{ 1{\cdot}66\dot{6} \,.\, w \,.\, z \,.\, (d + h) + \frac{0{\cdot}83\dot{3} \,.\, w \,.\, z \,.\, m^2}{d + h} \right\}$$

Dividing both sides by $\frac{w\,l\,z}{m}$, we get—

$$1{\cdot}66\dot{6}\, d + 0{\cdot}83\dot{3}\, \frac{m^2}{d} = 1{\cdot}66\dot{6}\, d + 1{\cdot}66\dot{6}\, h + \frac{0{\cdot}83 \,.\, m^2}{d + h}.$$

Multiplying by $(d + h)$, and deducting like quantities from both sides, we find

$$0{\cdot}83\, \frac{m^2 h}{d} = 1{\cdot}66\dot{6}\, h \,.\, d + 1{\cdot}66\dot{6}\, h^2.$$

But h being indefinitely small, the term having

* See Building News, No. 1,802, p. 65, "The Lightest Form of Plate Girder."

h^2 as a factor may be neglected, being insignificant in comparison with the others; then there remains $0{\cdot}83\,\frac{m^2h}{d} = 1{\cdot}66\,h\,.\,d.$

Whence— $d^2 = \frac{m^2}{2}$, and $d = \frac{m}{1{\cdot}414}$.

We will now prove the accuracy of this deduction arithmetically by assuming three values for d, which shall be respectively equal to $\frac{m}{1{\cdot}4}, \frac{m}{1{\cdot}414}$, and $\frac{m}{1{\cdot}428}$.

Let $l = 90$ft., $m = 15$ft., and $w\,.\,z = 12$ tons, then for the weight of struts and ties in one series of triangles, we have—

$$\frac{l}{m}\left\{1{\cdot}66\dot{6}\;w\,.\,z\,.\,d + \frac{0{\cdot}83\,w\,.\,z\,.\,m^2}{d}\right\} = \frac{90}{15}\left\{1{\cdot}66\dot{6}\times 12\times d + \frac{0{\cdot}83\dot{3}\times 12\times 15^2}{d}\right\} = 120\,d + \frac{13560}{d} = \text{weight in lb.} = W_B.$$

When—

$d = \frac{m}{1{\cdot}4} = 10{\cdot}714\ldots\ldots$

$$W_B = 120\times 10{\cdot}714 + \frac{13500}{10{\cdot}714} = 2545{\cdot}68\text{lb.}$$

$d = \frac{m}{1{\cdot}414} = 10{\cdot}608\ldots\ldots$

$$W_B = 120\times 10{\cdot}608 + \frac{13500}{10{\cdot}608} = 2545{\cdot}58\text{lb.}$$

$d = \frac{m}{1{\cdot}428} = 10{\cdot}504\ldots\ldots$

$$W_B = 120\times 10{\cdot}504 + \frac{13500}{10{\cdot}504} = 2545{\cdot}70\text{lb.}$$

From this we see that the minimum weight corresponds to a value of $d = \frac{m}{1{\cdot}414}$, as arrived at above.

This being determined, the depth has now to be considered; and this will be determined by comparison of the weights of the flanges and the longitudinal road girders. It has been shown above that the weight W of two longitudinals for one bay is $W = 15{\cdot}25z^2$ if the most economical depth in relation to span is adopted, and regarding the longitudinals as discontinuous, which is the correct view to take, as one bay may be loaded, while those on each side of it are not so. The weight of the longitudinals belonging to one main girder for the whole span will be—

$$\frac{l}{z}\times 15{\cdot}25z^2 = 15{\cdot}25\;l\,.\,z.$$

For a uniformly-distributed load the average stress on the flanges will be nearly $= \frac{2}{3}\,.\,\frac{wl^2}{8d}$.

This is assuming the parabolic area representing the stresses produced by a continuously applied load equal to the area representing the stresses due to a load applied, as in the case under consideration, the approximation is practically sufficiently close for the present purpose. Taking the stress per sectional square inch on the flanges at 4 tons, the weight of the two in pounds will be found from the expression—

$$2\times\tfrac{2}{3}\times\frac{w\,.\,l^2}{8\times 4\times d}\times 3{\cdot}33\,.\,l, \text{ in which } \tfrac{2}{3}\times\frac{w\,.\,l^2}{8\times 4\times d}$$

is the average sectional area in square inches of one flange. Simplifying, and calling W_F = the weight of the two main flanges, $W_F = 0{\cdot}139\,\frac{w\,.\,l^3}{d}$.

The value of w for the longitudinals has been taken on an average at 0·8 tons; that for the main girders must include, in addition, the weight of cross and main girders; the load will be taken at 2 tons per lineal foot, then—

$$W_F = 0{\cdot}139\times 2\times\frac{l^3}{d} = 0{\cdot}278\,\frac{l^3}{d}.$$

The total weight of the longitudinals and main girder flanges together will be—

$$15{\cdot}25\;l\,.\,z + 0{\cdot}278\,\frac{l^3}{d}.$$

We have now to find a value of d that will give a minimum total weight; proceeding as before, by making d become $d + h$, and neglecting terms having any power of h above the first as a factor, and replacing z by its value $0{\cdot}707d$, the equation found is—

$$10{\cdot}78\,.\,l\,.\,d + 0{\cdot}278\,\frac{l^3}{d} = 10{\cdot}78\;l\,[d+h] + 0{\cdot}278\,\frac{l^3}{d+h}$$

$$= 10{\cdot}78\,.\,l\,.\,d + 10{\cdot}78\;l\,.\,h + 0{\cdot}278\,\frac{l^3}{d+h}.$$

Therefore, multiplying both sides by—

$(d + h)$, $0{\cdot}278\;l^3 + 0{\cdot}278\,\frac{l^3\,h}{d} = 10{\cdot}78\;l\,.\,d\,.\,h$

Whence— $+ 0{\cdot}278\;l^3$.

$0{\cdot}278\;l^3 = 10{\cdot}78\;d^2$, and $d^2 = \frac{0{\cdot}278\;l^3}{10{\cdot}78}$; $d = \frac{l}{6{\cdot}227}$.

It will not often happen that the girder can be made of the exact proportions thus determined; it is, therefore, necessary to approach them as nearly as is practically convenient. It has already been shown that the value of $z = \frac{m}{2}$, should be $0{\cdot}707\;d$, and z must divide evenly into the effective span of the girder. There is another point which requires recognition, which is the inconvenience of making girders very high in proportion to span, especially when the roadway is on the top, and the higher the girder the stronger the cross bracing used to resist displacement by vibration must be. The influence of length on the struts is also to be regarded in this connection, and these are all practical points affecting each particular work according to the circumstances under which it is constructed.

It has been assumed in deciding the relative values of d and m that four tons per sectional square inch is the working stress on all the parts, struts, of course, included; it is therefore necessary to ascertain the proportion of least width to length corresponding to this, from the formula—

$$s = 4{\cdot}75 \div \left\{1 + \frac{r^2}{900}\right\},$$

it being understood that the struts are firmly riveted to the flanges and ties so as to be in the condition of having fixed ends. Inverting the formula—

$$\frac{1}{s} = \frac{1+\frac{r^2}{900}}{4{\cdot}75} = \frac{900 + r^2}{4275};\; r^2 = \frac{4275}{s} - 900.$$

Let $s = 4$, then r

$$= \sqrt{\frac{4275}{4} - 900} = 13;$$

therefore to maintain the working stress of four tons per sectional square inch, the length of the struts must not exceed 13 times their least width at the centre. The span of girder being 90ft., let $z = 9$ft., then $d = \frac{z}{0{\cdot}707} = 12{\cdot}73$ft., which is nearly one-seventh of the span.

It will not always happen that we can get the above width of strut in proportion to the length, and then a lower working stress per sectional square inch must be taken, and the ratio of d to m will be different from that given above. Let s = the working stress per square inch on the strut, and s_1 = that upon the tie, then using the same notation in other respects as before, the weight of the first strut will be $= 3{\cdot}3\dot{3}d \times \frac{w\,.\,z}{s}$

and that of the corresponding tie $= 3{\cdot}3\dot{3}\,\frac{wz(d^2+m^2)}{s_1\times d}$

the weight of the two together will therefore be—

$$= 3{\cdot}3\dot{3}\,\frac{w\,.\,z\,.\,d}{s} + 3{\cdot}3\dot{3}\,\frac{w\,z(d^2+m^2)}{s_1\times d}$$

$$= 3{\cdot}3\dot{3}\,.\,w\,z\left\{\frac{d}{s} + \frac{(d^2+m^2)}{s_1\times d}\right\}$$

This, multiplied by the number of triangles in one series, will give the weight in that series due to the one load $w\,z$, and the number in the series will be $= \frac{l}{m}$, thus giving for the weight in question—

$$= 3{\cdot}3\dot{3}\,\frac{w\,.\,z\,.\,l}{m}\left\{\frac{d}{s} + \frac{(d^2+m^2)}{s_1\times d}\right\}$$

$$= 3{\cdot}3\dot{3}\,\frac{w\,z\,l}{m}\left\{\frac{d}{s} + \frac{d}{s_1} + \frac{m^2}{s_1\,.\,d}\right\}$$

Let d become $(d + h)$, then, proceeding as before, neglecting terms containing any power of h above the first we have—

$$3{\cdot}3\dot{3}\,\frac{w\,z\,l}{m}\left\{\frac{d}{s} + \frac{d}{s_1} + \frac{m^2}{s_1\,.\,d}\right\}$$

$$= 3{\cdot}3\dot{3}\,\frac{w\,z\,l}{m}\left\{\frac{d+h}{s} + \frac{d+h}{s_1} + \frac{m^2}{s_1(d+h)}\right\}$$

Therefore—

$$\frac{d}{s} + \frac{d}{s_1} + \frac{m^2}{s_1 d} = \frac{d+h}{s} + \frac{d+h}{s_1} + \frac{m^2}{s_1(d+h)}$$

whence—

$$\frac{m^2}{s_1 d} = \frac{h}{s} + \frac{h}{s_1} + \frac{m^2}{s_1(d+h)}$$

Then, multiplying both sides by $s_1(d + h)$—

$$\frac{m^2 h}{d} = \frac{s_1 d\,h}{s} + h\,d;\quad m^2 = \frac{s_1 d^2}{s} + d^2$$

$$m^2 = d^2\left\{1 + \frac{s_1}{s}\right\};\quad d = \frac{m}{\sqrt{1+\frac{s_1}{s}}}$$

Let $s = 3$ tons per sectional square inch on strut, and $s_1 = 4$ tons for ties, then—

$$d = \frac{m}{\sqrt{1+\frac{4}{3}}} = \frac{m}{1{\cdot}527}$$

A careful examination of these figures and their application shows that sufficient attention has not been paid to this matter of economy in designing triangular girders, the ties being usually too short in proportion to the struts. It may here be mentioned that the general angle of the ties is departed from in the bays next to the points of support, as shown at $a\,a$ A, as the loads on the two series of triangles have in the end to be carried up to the same point A. This arrangement is equally applicable to lattice girders, which only differ from triangular girders in having a greater number of series of triangles; but the lattice girders do not give the same facilities for economising material, as, when the bars are much subdivided, it is found that towards the centre of the span the theoretical quantities are very much below those practically necessary.

So very strongly have the advantages of pin-connected girders been urged at different times that we cannot leave the subject without pointing out distinctly the disadvantages that are incurred by having the strut ends on what we may call jointed connections in contradistinction to solid riveted ones. When the ends of the strut are jointed the formula for the working resistance per sectional square inch becomes—

$$s' = \frac{19}{f} \div \left\{1 + \frac{r^2}{225}\right\}$$

Or, taking—

$$f = 4,\; s' = \frac{4{\cdot}75}{1+\frac{r^2}{225}}$$

Therefore—

$$r^2 = \frac{1068{\cdot}75}{s'} - 225.$$

If s' is to be kept at four tons per sectional square inch working stress, then—

$$r = \sqrt{\frac{1068{\cdot}75}{4} - 225} = \sqrt{42{\cdot}225} = 6{\cdot}5,$$

which is a much greater width than could be at all conveniently adopted. Referring to our example, z is equal to 9ft. and the load on main girder to two tons per lineal foot, therefore the summit load on one strut would be $9\times 2 = 18$ tons. These loads pass through the ties from strut to strut, so that passing from the centre of the spans to the points of support the stress on the struts increases in arithmetical progression. Of the load at b^{iv}, one half will pass through the tie $a^{iv}\,b''$, so that on the strut $b''\,a''$ there will be a stress of $1\frac{1}{2}$ summit loads, and this passing through the tie $a''\,b$, there will be a stress on strut $b\,a$ of $2\frac{1}{2}$ summit loads, or $18\times 2{\cdot}5 = 45$ tons, which, at a working stress of four tons per square inch, will require a sectional area of 11·25sq.in. The strut would be made of two flat bars, connected for lateral rigidity by light zigzag bracing bars, the depth of girder or length of strut being 12·73ft.; the proper width for the bar would be about 12in., so that two such bars $\frac{1}{2}$in. thick would make up the strut. If the strut were calculated to carry four tons per square inch with jointed ends, the width of its plates would be $12{\cdot}73 \div 6{\cdot}5 = 1{\cdot}96$ft., and therefore would only require to be $\frac{1}{2}$in. thick, which would be too thin to use for such work, so that excess of metal would have to be introduced. If the pin-joint were used and the bars made 1ft. wide, the working resistance would become as— $r = \frac{12{\cdot}73}{1}\,s' = \frac{4{\cdot}75}{1+\frac{(12{\cdot}73)^2}{225}} = \frac{4{\cdot}75}{1{\cdot}72}$

$= 2{\cdot}76$ tons per square inch, making the struts 44 per cent. heavier.

BRICK FOR STREET PAVEMENTS.

A CORRESPONDENT of the American journal *Science* states that about 50 towns in the United States use brick for paving the streets, and some have used it for as long as 15 years. Common building brick is quite unfit for the purpose, as it soon shows the effects of wear, but good hard brick always gives satisfaction. No paving material is equal to it except granite blocks, and it costs only a third of the latter. The most suitable bricks are those made from the common yellow joint clay, having a large percentage of silicate and iron. The laying

of a brick pavement, the writer says, is a simple matter. The foundation being brought to the proper grade, there is spread over it 6in. of gravel or sand, which is struck off with a board gauge fitted for the grade of the street. A course of brick is then laid on the flat surface, running lengthways along the streets. It is not necessary that this should be as hard as the upper course. Over this an inch of screened sand is spread, gauged, and properly smoothed off. The top course is then laid with the bricks on their edges lengthways across the street, the joints being broken in both courses. The whole is covered with an inch of screened sand, which is swept into the crevices. A roller weighing five or six tons is then passed over the pavement several times, and if this is properly done the pavement will be as smooth as one of wood, and almost as noiseless. The street must be drained, as the lasting qualities of the brick and the even surface of the street depend greatly on the drainage. The upper course should be very hard and of vitrified brick. Horses do not slip or fall on brick pavements, owing to the small surface between the seams. If water and frost are kept out of brick, the pavement is almost indestructible. A road properly paved with hard brick should last 50 years with very little repair, and the cost, at the prices of labour and material in the United States, would be about £2,000 a mile. In Decatur, in Illinois, where the whole town is paved with brick, the cost has been from 5s. to 6s. per square yard.

CHIPS.

Lord Leigh unveiled on Monday three memorial windows in St. Cuthbert's Church, Winsor-green. The windows are situated in the chancel, and consist of three lights each, with a single figure in each light, the pedestals and canopies, in the Perpendicular style, being in keeping with the architectural features of the church. The subjects treated are Abraham, Moses, Elijah, John the Baptist, Our Lord Jesus Christ, St. Peter, St. Paul, St. Andrew, and St. John. In the tracery of the centre window are Masonic emblems, and the other traceries are treated in grisaille. The designs are by Mr. S. E. Stacey, and have been executed by Messrs. W. Pearce and Co., of Bridge-street, Birmingham. The chancel has also been improved, the walls having been stencilled in pattern, and the iron lights replaced by brass standards, by Mr. G. Hadley, Monument-road.

A large memorial clock to the late Mr. Jessop has been erected in Ecclesall Church, near Sheffield. It has two 5ft. illuminated dials, strikes the hours upon a large bell, and plays the ding-dong quarters. It has been constructed chiefly to the designs of Lord Grimthorpe, and has all the latest improvements. The pendulum is 2cwt., all the wheel teeth are machine cut, and the makers, John Smith and Sons, Derby, guarantee it to keep time with less variation than two seconds a week.

The statue of the late Mr. Verdin will be unveiled at Northwich on September 14. Mr. Swynnerton is the sculptor, and it has been successfully cast in bronze by Messrs. John W. Singer and Sons, of Frome, Somerset.

Mr. E. H. Shorland, of Manchester, has recently supplied his patent Manchester grates to St. Paul's Terrace Schools, York.

A new railway station at Elswick, Newcastle-on-Tyne, will be opened for passenger traffic on September 1st. The building, which is in Scottswood-road, nearly opposite the foot of Clara-street, is similar in design to the new station at Heaton. There are booking-offices, waiting-rooms, and other apartments on an overhead bridge, and the platforms, of which there are two, are reached by a wide staircase. The station has been built from plans supplied by Mr. Bell, the North-Eastern Railway Company's architect, by Messrs. T. and W. Simpson, Blyth, the work having been carried out under the supervision of Mr. Storey, from Mr. Bell's office.

The Pilgrims' national monument at Plymouth, Massachusetts, commemorating the landing of the Pilgrim Fathers, which has been for thirty years in course of construction, was dedicated on Thursday in last week. The monument is a huge stone figure of Faith, with smaller groups surrounding it. On the pedestals are bas reliefs, representing historic scenes, including the departure of the Pilgrims and their landing on Plymouth Rock.

Redland Park Hall, Bristol, adjoining a chapel, has just been completed. It has been erected from the designs of Mr. H. O. Wills, and the contractor was Mr. Elijah Love, the total cost being £5,500. The large hall is 62ft. by 24ft., and 36ft. high, and will accommodate 500 persons. There are ten class-rooms, and a church parlour is also provided, seating over 100 persons.

Building Intelligence.

Bishopstoke, Hants.—The foundations of a new church for Bishopstoke, where extensive railway works and engineering shops are in progress of erection for the London and South Western Railway Company, have just been excavated. Mr. E. P. Warren, of London, is the architect, and the contractors are Messrs. Wheeler Brothers, of Reading. The church will be built of snapped flint with Box-stone dressings, the interior being faced with red bricks and plaster. The design comprises a tower, nave, south aisle, and chancel, with baptistery in the aisle. The interior length will be 96ft. to the tower; nave, 25ft. wide; chancel, 21ft.; and aisle, 12ft.; height, 41ft. to the ridge. The church will seat 340 persons. The organ chamber and the vestry are on the north-east side of the nave. The aisle is divided from the nave by an arcade of four bays. An entrance door and porch is placed on the south side. The main entrance will be through the tower. The subscriptions already received and promised exceed £2,000. The foundations will be got out for the whole design, but the fabric only is embraced in the present contract, the tower being left for a future time. The cost of the main structure, with the interior fixtures, seats, and heating apparatus, is estimated at £4,000, and the tower an additional £1,000.

Chester Cathedral.—Various alterations are being carried out at the present time in Chester Cathedral. The old shrine of St. Werburgh, which was formerly used as the Bishop's throne, on the restoration of the cathedral some twenty years ago was condemned by Sir Gilbert Scott, and a new one more in keeping with the tabernacle work of the choir was erected in its place. Since then the shrine has remained in a disused state behind the choir stalls, and has been anything but an ornament to the cathedral. It is now going to be put together, and set up close behind the reredos. To enable this to be carried out it has been necessary to pull down the screen between the choir and the Lady-chapel. The Communion-table has been removed, and two more steps are to be built below it. This will raise it 20in., and it will also be placed a foot further back. The new steps will have tiled treads and polished marble risers. On each side of the Communion-table there will be some ornamental iron-work. The north wall at the west end of the cathedral is being newly faced. The whole of the alterations are being executed by Mr. John Thompson, of Peterborough, who carried out the general restoration of the cathedral twenty years ago.

Chertsey.—Extensive additions and alterations have been made to the old-established Family and Commercial Hotel, Chertsey, designed by Mr. J. Marsden, architect, Chertsey, and carried out by Mr. H. G. Nesmyth, builder, Guildford-street, Chertsey. The walls are part weather-tiling and rough-cast. The floor is laid with wood blocks specially prepared and laid by Mr. H. G. Nesmyth. The walls are matchboarded 6ft. above the floor, and finished at top with a worked moulding. Special attention has been given to the ventilation. The passage between the house and new building is covered in with the new wire-wove glazing material, which is quite a novelty in that district. The work has been so satisfactorily carried out that the proprietor of the hotel, Mr. Flecknee, gave a supper to about thirty men in the employ of Mr. H. G. Nesmyth as an acknowledgment of his appreciation.

Golspie.—The restoration of the monument erected to the memory of the first Duke of Sutherland on Ben-Bhraggie, a hill 1,314ft. high, situated at Golspie, 89 miles north of Inverness, has been intrusted to Mr. Joseph Blackburn, Gresham Works, Nottingham. The pedestal stands 78ft. high, and is surmounted by a colossal statue 30ft. high, by Chantrey. The hill rises almost perpendicular from the sea, which it overlooks; also Dunrobin Castle, the seat of the present duke, and the village of Golspie. This monument is said to be placed on the highest site for a statue in the world, and, by way of illustrating this, the men working on the head of the statue, which rises 6ft. from the shoulders, would be 414ft. higher than the Eiffel Tower. The system of scaffolding adopted by this firm, and the success with which the apex was reached, caused considerable interest in the neighbourhood, and the men were curiously watched at their work from a distance through telescopes and binocular glasses. The same firm are also making a specially-constructed lightning conductor to be erected on the monument. The work was surveyed by Mr. W. J. Furse, manager of the firm, and all arrangements made for undertaking this important and apparently (to the uninitiated) dangerous work.

Northampton.—The memorial-stone of the extension of the Town Hall of Northampton was laid on the 1st inst. by the Mayor. The Town Hall, a building in the Decorated Gothic style, was erected from the designs of the late E. W. Godwin in 1861-4, but has become inadequate to the requirements of the borough. The designs for the extension were prepared by Mr. M. H. Holding, of Northampton, and Mr. A. W. Jeffery, of Hastings, their designs having been placed first by Mr. C. Barry in a competition. The contractor is Mr. H. Willcock, of Wolverhampton, whose tender was accepted at £21,353, and Mr. E. Gray is the clerk of works. The works will include an extension into St. Giles's-square, containing new municipal offices, improvements within the existing building, and new police arrangements. The new basement is entirely of fireproof construction, and will contain a large muniment room, workshops and stores, lavatories, and cells in connection with the Sessions Court. On the ground floor will be new offices for the town clerk and for the magistrates' clerk, both with strong rooms, and offices for the water department, a magistrates' retiring-room, and a Mayor's parlour; and on the first floor will be the new Council Chamber, 51ft. by 28ft., and offices for the borough surveyor. The alterations to existing buildings will include, in the basement, new heating chamber, lifts, serving-rooms, and scullery. On the ground floor there will be an entire remodelling and enlargement of the Sessions Court, new rate offices and strong rooms, new offices for the medical officer of health, &c. A new platform and orchestra at opposite end of the large hall will be made, as well as exits and staircases for the performers. The existing Council Chamber will be retained as a committee-room and grand jury retiring-room. The police arrangements will be situate in Dychurch-lane, and comprise charge office, and offices for the Inspector of Weights and Measures, parade-room, 55ft. by 20ft., together with cells; airing yards, police dormitory, and recreation room. The façade in St. Giles's-square is designed to blend with the existing work, though a considerable departure will be made in the introduction of a lofty central gable, with tall flanking turrets, by way of counterpoise or balance against the existing tower. The fenestration of this new gable will be a variation upon the existing work, although conceived in the same spirit. The scheme of sculpture reliefs and range of statues will be extended with additions. The extensions on St. Giles's-square will be entered by groined vestibule leading to a flight of steps, by which the internal vestibule, surrounded with arcades in wrought stone and shafts of red Mansfield stone and polished granite, is reached.

Southampton.—The foundation stone of the Gordon Boys' Home at Southampton was laid on Saturday by Princess Beatrice of Battenberg. The site adjoins that of the Y.M.C.A., in Ogle-street, and the building will consist of a public receiving office, approached through a porch, and leading into the Assembly Hall, 30ft. by 22ft., and 13ft. high. This is intended for the boys to assemble, wait, and drill in, and will have a patent concrete floor. The walls will be faced with red brickwork, the lower part being executed in glazed buff bricks to form a dado. The lavatory and offices are placed in the rear of the assembly hall. Access to the upper portion of the premises is to be by a teak staircase from the large hall. The first and second floors will provide a reading-room, 22ft. by 18ft.; clothes-room, 22ft. by 15ft.; mess-room, kitchen, larder, and drying-room. The street façade is Gothic in style, and is to be executed in local bricks with dressings of Ham Hill stone. The building is now in course of erection by Mr. Jonas Nichols, J.P., whose tender was lowest in a limited competition. The honorary architect is Mr. W. H. Mitchell, Portland-street, Southampton.

Warton, Lancashire. — The restoration of this church is almost completed. Six months ago the rain came through the roof in streams, and

the building was in a deplorable condition. The aisle roofs joined that of the nave at the eaves of the latter, and a flat plastered ceiling hid all the roof timbers. The clerestory windows had been broken beyond recognition, and then walled up. No two windows in the aisles were on the same level, and the glazing fixed without any grooves being cut in the stonework. The tower battlements were decayed to such an extent that the moulds were hardly noticeable, and the pinnacles entirely done away with. The slates in many places had been blown away, the woodwork of roofs being left to the mercy of the weather. The contractor for the whole works is Mr. J. Garden, of Dalton-in-Furness, who has carried out the works under the direction, and from the drawings of Mr. J. Arthur Hope, architect, Huddersfield.

Woolwich.—On Sunday week the Bishop of Southwark opened the new chancel and side chapel just added to the R.C. Church of St. Peter, Woolwich. Designed not much less than fifty years ago, by Welby Pugin, no more had up till now been erected than the nave, aisles, and Lady-chapel. The present additions have been carried out on the lines of the original design. Pugin's five-light east window, which at the erection of the church was temporarily fixed in the bricked-up chancel-arch, has been replaced in the new east wall, the other old windows being similarly treated. The original high-altar has likewise been re-erected. The new chancel is 27ft. long, 23ft. broad, and 38ft. high to the apex of the panelled roof. It is simple in character, deriving effect chiefly from its internal height and the ornamental roof, which is boarded, ribbed, and enriched with carved bosses bearing the sacred monogram, and the cross-keys emblematic of the patron of the Church. The work is in style of the Decorated period, and of the pure English type characterising the previously existing portions. The architect is Mr. Frederick A. Walters, F.S.A., of 4, Great Queen-street, Westminster, the contractors being Messrs. Goddard and Sons, of Farnham and Dorking.

CHIPS.

Melrose Abbey has lately been showing marked dilapidation, but the decay has been stayed. The north side of the building, which was much damaged by the weather, has been pointed, and the joints and fissures in the niches of the side chapels have been similarly fortified. A number of young trees and shrubs which were displacing the masonry have been removed, and the roof of the building has been repaired. The churchyard has been levelled at the instance of the heritors.

It is estimated that at the present time £60,000 is being spent in erecting property of various kinds in Peterborough. At great cost the G.N.R. station is being partly reconstructed, and £16,000 is to be spent on the G.E.R. station. The Wentworth Hotel and adjoining block of buildings are being converted into a modern hotel, at an inclusive cost of about £10,000 by the Northampton Brewery Co. The city is being repaved throughout. In addition to these works the cathedral was reopened a month since after restoration from Mr. Pearson's designs.

The parish-church of Roseash, about six miles from South Molton, was reopened last week after the restoration of the nave and aisle at a cost of £700. The north wall and greater part of the south wall of nave have been rebuilt, the roof over aisles reconstructed, and the aisle-screen restored, the floors relaid with wood blocks under seats, and Godwin's tiles for passages and the tower, and opened out to nave. Messrs. St. Aubyn and Wadling, of London, were the architects, and Mr. Clotworthy, of Witteridge, was the builder.

The Grimsby and North-Sea Steam Trawling Company have decided to erect a Fisher-lads' Home, situated in Humber-street, Grimsby, and have instructed Mr. E. W. Farebrother, architect, F.R.I.B.A., to prepare the designs.

The parish church of Tathwell, Lincolnshire, has been reopened after restoration. The walls and roof of nave and chancel have been repaired, the flat plaster ceiling removed, the rough timbers cased, the gallery removed, the floors re-laid, the pillar bases restored, the nave reseated with open benches, the east wall of the nave pierced with small arches (thereby opening the chancel to the nave), and a handsome south porch erected. These works have been carried out by Messrs. Walter and Hensman, of Horncastle, from plans by Ald. Fowler, of Louth. The cost has been about £550. A new pulpit and lectern have been provided. On the corbels of the inner doorway of the new south porch are carved the heads of the present Bishop of Lincoln and St. Vedast respectively.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., LIV., and LV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Received.—R. G. S.—P. G.—W. L.—B. of N.—L. E. L. B.

Correspondence.

THE COST OF SPOILING ST. ALBAN'S.

To the Editor of the Building News.

Sir,—As I am not an amateur masquerading as architect, but have been intimately associated with building matters for forty years, the Messrs. Longmire's pleasantry about "a little," &c., but little applies. In spite of their statements my opinion of the money value of the work done done at St. Alban's remains unaltered. The assertion from Messrs. L. that their patron has spent £80,000 on the Abbey works shows clearly to my mind how much better financially it would have been for him if he had employed an architect. I am amazed by the profuseness displayed and proportionately saddened by the egregious mis-spending of such a handsome sum. No wonder the Messrs. Longmire think well of such a client. They evidently rightly appreciate the law and the profits. The man of law has been so long-i'-the-mire it is not very remarkable his wanting now to be a Longmire, and share the profits, too. He had better wash his hands of the whole affair. Their statement of having spent "far more than £30,000" on the job "for wages alone" is a heavy tax on one's credulity. Let us look for a moment at what the money represents. Much of the labour would be, of course, unskilled, for it requires little or no skill to destroy, so if the wages are taken on the average at 30s. per week per man it will suffice; also, we will suppose that the "far more than £30,000" to be £45,000, which at the above rate is equivalent to the constant employment "all the year round" of 115 men for five years, or 72 men for eight years. Does this appear probable? I am glad to add to my little stock of knowledge, but happily am not obliged to believe all I am told.—I am, &c. M.

ST. ALBAN'S CATHEDRAL AND ITS RESTORATION.

Sir,—When I wrote the letter which appeared in your impression of July 19 I had no idea of continuing the correspondence. But I now trespass on your courtesy so far as to ask you to allow me to make a few more remarks, partly with reference to counter-statements, partly by way of supplement to my former letter. 1. Mere contradictions, of course, are not worth noticing. But one of your correspondents devotes some amount of real argument to attempting the demolition of my statement about the weakness of round-angle turrets. I never said a word against the suitability or strength of that form for large towers with very small windows—especially for isolated structures, such as the old round towers of Ireland and lighthouses. I was simply referring to angle-turrets, and I distinctly spoke of the round as "the weakest of all forms for such a position," *i.e.*, at an angle, where it has to combine the functions of a staircase and a pair of buttresses. Windows, too, unless they are mere loop-holes, have a particularly weakening effect in round towers, both in appearance and in reality, and the windows in the decayed turrets at St. Alban's were large. Moreover, it should be remembered that a round turret is only three-quarters of the size of a square one of the same diameter, nor does it look more.

2. A very fair estimate of the value and character of most of the criticisms of this great work may be formed by comparing the outcry about a pair of commonplace hinges on a commonplace and rotten door (I wonder whether their admirers have ever seen the ancient ironwork on the doors of Worksop Abbey?) with the utter silence, so far as I have observed, of the same critics about Lord Grimthorpe's discovery and admirable restoration of the grand old Norman doorway in the south transept, for which his lordship deserves the hearty thanks of all lovers of the beautiful in ancient art.

3. The mention of the south transept naturally brings me on to tackle the assertion that the work here is worse than in the west front, and that it is so because Lord Grimthorpe had the help of Mr. Chapple in that design, and only an inferior clerk of works for the transept, on account of Mr. Chapple's death. Now, all through the winter of 1885-6 Lord Grimthorpe was being abused in sundry newspapers for the commencement of the south transept. Therefore his design and Chapple's working drawings must have been made before then. Mr. Chapple did not die, in fact, till 1887, in which very year the south transept was described in the *Times* as finished. (I have the cutting at home.) Now, what is this but the most reckless unscrupulousness as to truth on the part of the assailants of Lord Grimthorpe? Because the slightest reference to the open, published, notorious facts of the case—annals to which these very persons, or their allies, contributed—would have shown that there was not even the shadow of a foundation for their assertions. I may add that I saw the finished design myself at least a year before Chapple was even laid by.

4. So none of your correspondents can give any other specimens of the mode of treatment of windows, to which they give the name of "sham," or even identify my three. I will give them a fourth. Where is the great modern church by a great modern architect in which he made the east and west belfry windows (four) "shams"—and very wisely, too—in order to strengthen the tower against the swing of the bells? Is it possible that more can be known of this subject by

August 10. A Northern Vicar?

"PUTTING ON THE SCREW."

Sir,—In a little town not far from here there has recently been a strange example of tendering. It appears there is to be a new building erected there, and, of course, tenders were invited in the usual way. When the committee met to open the tenders it was found that the lowest tender was considerably above the estimated outlay. Here was a predicament. Should they increase their powers of expenditure, or curtail the plans? But a brighter idea than either of these gained the day. What could be more simple and suited to the case than to ask the builders tendering lowest to reduce their amounts. This original idea was at once acted on, and, lo, what a strange result! A builder from a neighbouring town obligingly offered to reduce his tender by £60 to

suit the requirements of the committee. (This gentleman's tender, by the way, was a few pounds above the lowest in the original.) This obliging offer was at once accepted. Now, Sir, the pith of the question is this. In these days of severe competition, when builders have to strain every nerve, and reduce their margin of profit to the smallest dimensions to obtain a contract, is it right after the tenders are opened to again ask builders to screw down a large sum more? Can it be fair to the party tendering lowest that a person who has tendered higher in the open competition should be allowed to recklessly underbid them afterwards for the sake of obtaining the job?

Excessive competition is the curse of the building trade at the present time, and produces more bad building and bankruptcies than anything else, and such a pernicious system as I have here described makes it doubly worse. If any of your able correspondents would throw a little light on the subject I should be obliged. The lowest tender when first sent in was below £1,000, so you will see the proportion of reduction.—I am, &c., OBSERVER.

Totnes, August 13.

THE SOCIETY OF ART MASTERS.

SIR,—In your issue for the 2nd inst., certain resolutions submitted for consideration at the annual meeting of this society were published in the form in which they were drafted, and not as they were ultimately amended and carried.

I inclose a copy of the resolutions in the form in which they were adopted.

1. That, in the interests of Art Education throughout the country, this Society renews the expression of a strong desire that the measure of success attained by each candidate in the annual examinations, as indicated by marks, should be communicated to the schools.

2. That while the members of this Society are content that the amount of payment on results should be dependent on the amount of the Parliamentary Grant available for this purpose, they feel that the best interests of the students demand that the results of the examinations, as determined by the examiners, independently of the money grant, should be communicated to the Masters and Students. They would also suggest that, if it be found necessary, the amount payable on each minimum pass might be determined by the Department *after* the results of the Examinations are known.

3. That the examination paper in Section 1 of the Elementary Stage in Practical Plane and Solid Geometry should be a distinct and separate paper, not as at present, printed on the same sheet with more advanced stages of the same subject, and that the probable requirements of art students should be considered in framing the paper.

4. That the simplification of the system of attendance registration in Art Schools is highly desirable, and is respectfully commended to the attention of the Department.

—I am, &c.,
London, Aug. 15th. FRANCIS FORD.

CHIPS.

At the Wigan Borough Police Court, on Monday, Mr. W. Roecroft, on behalf of the magistrates assembled, presented Mr. A. Millington, builder, of Wigan, with an address on vellum in recognition of his gallant conduct in saving a child from drowning in the canal on the 20th June.

The town council of Oswestry has passed a resolution requesting the Liverpool Corporation to obtain an independent report from an engineer of standing as to the safety of the Vyrnwy embankment. The Shropshire and Worcestershire county councils are taking similar measures, and their example will probably be followed by the local authorities on the line of the acqueduct.

Probate of the will of the late Mr. John Frederick La Trobe Bateman, past president of the Institute of Civil Engineers, who died on June 10th, aged 70 years, and had supplied Glasgow with water from Loch Katrine, and had promulgated a plan for supplying London with water from Bala lake, in Wales, has been granted. The personalty is sworn under £43,230.

Mr. Banister-Fletcher was on Tuesday sworn in Master of the Worshipful Company of Carpenters.

The Sheffield town council resolved on Wednesday to make application to the trustees of St. George's Guild that the contents of St. George's Museum at Walkley should be lent to the corporation for a period of not less than 20 years, to be placed in Meersbrook Hall, the corporation to furnish the building for the purpose, to adapt part of it for students, and to undertake the maintenance of the museum; allowing the master of the guild and his nominee and two trustees thereof to be associated with them in its management and control.

We regret to announce the death of Mr. John Gregory Crace, of Wigmore-street, the well-known art decorator, and the father of Mr. J. D. Crace. Mr. Crace, who died on Tuesday at his residence, Springfield, Dulwich, was in 81st year.

Intercommunication.

QUESTIONS.

[10032.]—**Furnace for Burning Rubbish.**—I wish to construct a detached furnace entirely above the ground level with a chimney shaft for burning rubbish. Can any reader inform me what should be the superficial area of fire space so as to consume from eight to ten tons per day of ten hours? A reference to some existing building, or to published drawings of such a furnace, or a sketch section showing construction, thickness of walls and vault over, and method of lining with firebrick will oblige.—J. B.

[10063.]—**Fire.**—My client's house and shop are burnt out, the walls only standing, which will not require to be rebuilt. The house and shop are insured for £800 in a good office. Which is the best way to make a claim, and on what should I base it? I propose getting out the plans, taking out the quantities, and obtaining tenders to reinstate the premises, and sending in the lowest tender plus my charges as the amount of my client's claim. Can our own builder do the work, or can the insurance company claim to do it without doing it to my satisfaction or in any way recognising me? If any reader who has had experience in these matters could give me any information or advice, I should be obliged.—J. D. S.

[10064.]—**Depression of Trade.**—Can anyone suggest, from personal experience, anything that could be cut out or manufactured in a small steam sawmill and joiner and wheelwright's shop that would find a ready sale in large towns at a profit? Having fitted up machinery in a small agricultural town, and through depression, there is not sufficient trade in the neighbourhood for capital laid out. English timber can be had at a reasonable price. Cutting out felloes does not pay, as there is so much waste, which we only get firewood price for.—TIMBER.

REPLIES.

[10044.]—**Churches with Chancels not in the same Axis.**—The replies of Mr. Seth Smith and "M." represent two views of the subject. I am inclined to think there was a symbolical meaning intended in the variation, as the means of setting out buildings on one straight axis must always have been practicable, and could not have depended on any inferiority of the instruments used. The setting out or ranging of a straight centre line by rods was known from the very earliest age. What Mr. Seth Smith says is, I believe, pretty well established: another explanation given is that the variation of the chancel to the south observable in many plans, as at Netley Abbey Church, was intended to indicate the inclination of our Saviour's head on the Cross. The fine example of divergence mentioned by "M." of Holy Trinity Church, Stratford-upon-Avon, is remarkable, and is on the contrary, or north side, and its considerable deflection shows conclusively that it must have been intentional. On the whole, I am inclined to think that these deflections could not have been accidental.—G. H. G.

[10046.]—**Warren Girder.**—Fig. 109, Plate VI., is an illustration for home work, the information in Lecture VI. being sufficient to work it out. See middle of p. 51. "In order to get the strains correctly with a distributed load, *or a load or loads out of the centre*, it is necessary to work from the abutments towards the centre." The two bars under the load are *not* equally strained, because the load is *not* in the centre of girder. In Fig. 94 the vertical component is received by abutment, as shown in Fig. 95, = ·866*z*. In Fig. 119, A B is downward thrust, or load on support at foot of rafter, B C horizontal thrust at foot of rafter tending to overturn wall, A E horizontal thrust against wall at head of rafter when it simply leans against a vertical support. Fig. 118 is explained by the following paragraph at middle of p. 57:—"In the example we have taken above, the external forces, taken together, really form a closed polygon; but the sides overlie each other. If we open them a little, as in Fig. 118, we shall see this relationship better." The opening is, of course, imaginary, as two straight lines cannot inclose a space; but it helps to show how the figure is made up. I think you should read the letterpress more carefully.—HENRY ADAMS.

[10056.]—**Wenlock Abbey.**—"M. C." will find plans and sections of Wenlock Abbey (not "Priory") in Parker's "Domestic Architecture," Vol. IV. p. 366.—M.

[10057.]—**Pumping.**—Taking the head of water to be 170ft., the pressure on the pump is 73·780lb. per square inch. Now, assuming the depth of the reservoir to be 20ft., the head of water at starting will be 150ft., with a pressure of 65·100lb. per square inch, which will be the pressure on the pumps when the water first enters the reservoir, and which will increase with every foot gained until full, when the pressure will be 73·780lb. per square inch; so that at starting the pumps have 13·680lb. per square inch less than with an overshot main—*i.e.*, delivering the water over the top. With an overshot main the pumps are always working at the same pressure; whereas with the rising main entering the bottom of the reservoir, the maximum pressure is only reached when the reservoir is full.—ARTHUR LEWIS.

[10058.]—**Easements.**—The law as to easements has not been altered as regards ancient lights; the prescriptive period which gives a right is still 20 years. "M. S. A.'s" friend, the solicitor, referred to the Property Limitations Act, 1874, and not to easements. Twelve years is the time allowed within which a person can recover land.—G. H. G.

[10061.]—**Lime and Cement.**—If "C. W. S." makes his mortar of two parts of washed sand to one of cement, it will answer all the purposes for which he requires it.—R. WATSON.

[10061.]—**Lime and Cement.**—"C. W. S." had better follow established usage and not mix. Mortar is cheaper, but cement stronger. There is no advantage in mixing—the setting qualities of the two compounds are at variance.—M.

The partnership heretofore subsisting between Messrs. Sherlock, Wood, and Keef, of Liverpool, architects and surveyors, has been dissolved.

LEGAL INTELLIGENCE.

EASEMENTS OF LIGHT AND THE ARTISANS' DWELLINGS ACTS.—BARLOW AND OTHERS v. ROSS.—At Birmingham, on Saturday, Mr. Justice Hawkins gave judgment in the action of "Barlow and others v. Ross," which had been tried before his Lordship and a special jury. The case raises for the first time a point of considerable importance under the Artisans' Dwellings Act, 1875, 38 and 39 Vict., cap. 36. The action was one to recover damages for obstruction to the light and air coming to the plaintiffs' buildings by reason of the erection by the defendants of lofty buildings opposite to them. Evidence was given as to the injuries, and eventually the jury assessed the damages at £100, being the capitalized value of a depreciation of £5 per annum in the letting value of the buildings. The defendants, however, relied on two other defences as a legal answer to the plaintiffs' claim—(1) that the plaintiffs had acquiesced in the erection of their buildings; and (2) that by virtue of section 20 of the Artisans' Dwellings Act all claims of easement over land purchased under it were extinguished. Mr. Justice Hawkins, in giving judgment, decided first that the defence of estoppel by acquiescence was not established, holding, on the authority of "Wilmot v. Barber," that the plaintiffs were not to be deprived of their legal rights unless their conduct had been such as to make the assertion of these rights fraudulent as against the defendants. As to the other point, that the plaintiffs' rights were extinguished by section 20 of the Act quoted, he thought the defendants' contention right. The section says that upon the purchase by a local authority of any lands required for the purpose of an improvement scheme, "all rights of way, rights of laying or of continuing any pipes, sewers, or drains on, through, or under such lands—and all other rights or easements in or relating to such lands—shall be extinguished, subject to the provision that compensation shall be paid by the local authority to all persons proved to have sustained loss" by it. The plaintiffs' buildings were erected in 1867, and the site of the defendants' buildings was then occupied by much lower buildings than those now erected. In 1877 the Corporation of Birmingham, as local authority, acquired the site from its then owners under their improvement scheme, and in 1888 the defendants erected their present buildings on land of which they had taken a 75 years' lease from the corporation. When the land was acquired under the improvement scheme in 1877 the plaintiffs' buildings had not acquired any absolute easement of light, as an uninterrupted enjoyment of 20 years is required by the prescription Act, 3 and 4 Will. IV., cap. 41, sec. 3. A question had been raised by the plaintiffs whether the easement of light, not being expressly mentioned in section 20 of the Act of 1875, was affected by it at all, but he agreed with the view taken by Vice-Chancellor Hall in the case of "Badham v. Morris," that this easement was one of those dealt with by the section. In the present case, the easement, if it had accrued at all, had accrued subsequently to the purchase of the land by the corporation. The plaintiffs had contended that, as the easement did not then exist, it could not have been bought up and extinguished, but in his view this contention was contrary to the evident intention of the Legislature, which meant under these improvement schemes to give land to local authorities freed from all adverse rights, whether complete or only at the time inchoate. In his opinion, the period during which an easement had been enjoyed prior to a purchase under the improvement Act could not be added to an enjoyment subsequent to such purchase, so as to make up 20 years' uninterrupted enjoyment, and confer any prescriptive rights, though, of course, an enjoyment for 20 years after the purchase would create a fresh easement. There must therefore be judgment for the defendants, notwithstanding the verdict. Execution was stayed to enable the plaintiffs to appeal if so advised.

ACCESS TO NEW ROADS.—THE HENDON LOCAL BOARD v. POUNCE.—An application heard by Mr. Justice North on the 8th inst. was one of public interest with respect to the power of local authorities to compel the owners of land to provide sufficient access to new roads. The defendants were Mr. Pounce, the owner of land to the south of Church-lane, Hendon, on which building operations have been commenced, and the builder, Mr. Cooper. The defendant's land does not itself abut on Church-lane, but is connected with it by a narrow road, 17ft. or 18ft. wide in its narrowest part, of an average width of about 20ft., and about 30 yards long. In continuation of this, at right angles to Church-lane, the defendants have laid out a new road 40ft. wide, and have commenced to build houses fronting it. The local board contended that the defendants had not complied with their by-laws with respect to new streets and buildings, so far as they were not providing access to the new road of proper width. Fruitless negotiations had taken place between the Hendon Local Board and the defendants as to their procuring access to a parallel road called John-street, built some years ago, which is also narrowed at its mouth in Church-lane to 30ft. only. A motion was now made on behalf of the

Board to restrain the defendants from constructing the road or building houses on it without providing an access 40ft. in width. Mr. Justice North said the object of the by-law requiring access of equal width with the new road was clear and plain; it would be of no use requiring the new part of the road to be of at least 40ft. throughout if it were constricted at the end, where the old road was giving access to the main thoroughfare. The meaning of the by-law was that the defendants should not make their road unless they made access at one end of the same width, whether they had to do so over other people's land or their own. It was most conducive to and necessary for health that roads should be of proper width throughout, in order that they might be kept dry and have a current of air. Then it was said that the by-law was unreasonable. The by-law did not require the defendants to widen any road; all it said was that they should not construct a new street unless they provided an entrance at one end of equal width. His Lordship granted an injunction till the trial.

Kirk and Randall v. The East and West India Docks Company.—In the Court of Appeal last week, this case was heard by the Master of the Rolls and Lords Justices Lindley and Bowen. It was an appeal against a decision of Justices Denman and Stephen, refusing to set aside an award of Sir Frederick Bramwell on a submission to arbitration between parties. Messrs. Kirk and Randall were the contractors for the construction of the Company's docks at Tilbury, and during the course of the work, and subsequently to the completion of the docks, disputes arose between them and the Company, with respect to the scale of charges on which the contractors were to be paid for different classes of work. The contention of the contractors was that, owing to the nature of the soil, the cost of the work had been far larger than had been anticipated by any of the parties, and that therefore they were entitled to receive extra remuneration for the extra work performed. The case had already been taken once before the House of Lords, and was ultimately referred back to the arbitrator, who made a fresh award with regard to part of the case in favour of the contractors, to the amount of about £165,000. The company sought to set aside the award on the ground that it did not carry out the order of the House of Lords; but the Court below refused to set it aside. Hence the present appeal. Their Lordships affirmed the decision of the Court below, and dismissed the appeal with costs.

WATER SUPPLY AND SANITARY MATTERS.

York.—Mr. Samuel J. Smith, C.E., held an inquiry last week on behalf of the Local Government Board into the scheme for the better drainage of York, to carry out which the Corporation have applied for sanction to borrow £101,000. Obligation was put upon York, under the Boundaries Extension Act, to prepare within two years after it came into operation a scheme for the efficient drainage of the city, the same to be submitted to the Board above for approval. There is also a general obligation under the Public Health Act. Mr. James Mansergh, C.E., the engineer of the scheme, explained the proposed works. It was intended to lay several lines of main intercepting sewers at such depths as would pick up all the existing sewers and convey the sewage to a pumping station, to be erected just at the southern boundary of the city on the east bank of the Ouse, not far from St. Oswald's Old Church, Fulford. As the medical officer of health for the city held very strongly that the normal level of the subsoil water in some parts of the city was so high as to be prejudicial to health, it was intended to take steps to lower the level. The sewage would be subjected to a process of chemical precipitation, and the effluent then allowed to pass direct into the river. He proposed to construct such works as would deal effectively with the present and prospective volume of sewage 10 or 12 years hence, and so arranged as to permit of further extension in the future. Mr. Mawbey, city surveyor, also gave evidence.

The Carlisle corporation have elected a city surveyor in succession to Mr. McKie, resigned. There had been seventy candidates, from whom the following three had been selected for final submission to the council:—Mr. W. Howard Smith, assistant to the borough engineer, Leeds; Mr. Middleton, assistant engineer, Birkenhead; and Mr. Wynne-Edwards, assistant engineer, Carlisle. On the first count there voted for Mr. Smith, 15; for Mr. Wynne-Edwards, 15; and for Mr. Middleton, 4. On a second ballot there voted for Mr. Smith, 21; and for Mr. Wynne-Edwards, 13. Mr. Smith was then declared duly elected.

A new church is being built at Langley, near Birmingham, at an outlay of about £4,800. Mr. T. Rowbotham, of Birmingham, is the builder.

The dissolution of the partnership heretofore subsisting between Messrs. Hurst and Boldshaw, of Southport, architects and surveyors, is announced.

Our Office Table.

The arrangements for the second annual Art Congress, which will be held in Edinburgh at the end of October, are approaching completeness. The Presidential address will be delivered by the Marquis of Lorne on Monday, October 28. On Tuesday morning and afternoon, and the afternoons of Wednesday, Thursday, and Friday, the presidents of the different sections will deliver their addresses, and each address will be followed by two important papers in the section, and closed with discussion. On the mornings of Wednesday, Thursday, and Friday the Congress will meet in sections, or in combinations of two or three sections. In the section of Sculpture papers will be read by Messrs. Alfred Gilbert, A.R.A., G. A. Lawson, E. Roscoe Mullins, G. Simonds, T. Stirling Lee, D. W. Stevenson, and W. B. Rhind. In the section of Painting papers have been promised by Mr. G. F. Watts, R.A., Mr. W. F. Yeames, R.A., Mr. J. E. Hodgson, R.A., Professor Richmond, A.R.A., and Professor Herkomer, A.R.A. The other sections are likewise in an advanced stage of organisation. On Tuesday, Thursday, and Friday evenings free lectures and addresses will be delivered to working men. Mr. Walter Crane will speak to them on "Book Illustration," Mr. Cobden Sanderson on "Book Binding," and Mr. Whitworth Wallis, of Birmingham Museum, and Mr. William Morris are likewise expected to take part in the working men's evenings.

The seventh report of the Commissioners for the Exhibition of 1851 just published, gives some information as to the proposed future management of the South Kensington Estate, which will be of interest. As has already become known, a road 75ft. wide is being constructed from Exhibition-road, Queen's Gate, cutting the land into two sections. On the north a central space 150ft. in depth will be left open, and the Prince Consort Memorial will be removed to its centre. The remainder of the ground is to be built over, and will be let off on leases for mansions, with the exception of a block of 200ft. square, reserved for the proposed Royal College of Music. The one satisfactory feature about the report is that Mr. Alfred Waterhouse, R.A., will be consulted as to the suitability of the designs for the college and mansions for their position, and to harmonise with existing buildings adjoining the site. The Commissioners have accepted a tender for a building lease of the two sites on the north of the new road at a rent of £5,000 a-year, the lessee to have the option of also taking within a certain time the two sites on the south side at £3,000 a-year. The Commissioners assert that sufficient space is reserved to provide accommodation for the future development of the Science and Art Department, while £5,000 a-year, to be ultimately increased, will be allotted to scholarships for the purpose of assisting provincial technical institutions of science and art.

The Society of Arts offers the sum of £150 in money prizes, as well as twenty of the Society's bronze medals, for objects in the Arts and Crafts Exhibition to be held in October next and during the winter months. The judges will be empowered to distribute the money, or such proportion of it as they see fit, in any sums they think will best meet the relative merits of the exhibits, at the same time paying due regard to the cost of production. The whole sum will only be expended in case of works of sufficient merit being forthcoming. The Arts and Crafts Exhibition Society do not undertake responsibility in respect of the awards of the prizes, which will be a matter solely under the control of the Society of Arts. The rules under which the prizes are offered are substantially the same as those under which the previous art-workmanship competitions of the society have been carried out.

Hotel enterprise is not abating in Australia. The "Australia Hotel," Sydney, will rival in height the other great hotels of the colonies. This building will be seven stories in height, and stands on a corner site in Castlereagh and Rowe-streets, 114ft. by 161ft.; its total height will be 182ft. A grand central court, 72ft. by 35ft. is one of the leading features of the plan, and is proposed to be covered by an iron and glass roof, and paved with marble tiles. The dining saloon, approached by a corridor 16ft. wide, will be 100ft. by 40ft., and 25ft. in height. There will be 200 bedrooms, and every convenience will be supplied. Messrs. Bransfield are the architects. The principal façade is broken by a projecting centre crowned by a dome. The side wings have arcaded balconies on the first two stories above, which are four tiers of balconies supported on coupled columns. Quite a mammoth scaffold has been erected on the site, which stands on four lofty legs, each of lattice work construction.

On Wednesday, the 7th inst., the opening dinner of the Bromley and County Club took place at their new club-house, in the High-street, Bromley. The building, which has been erected by Mr. D. W. Harris, and leased to the club, consists of a spacious hall and staircase, reading-room, 33ft. by 24ft., with verandah commanding a richly wooded view; billiard-room for two tables, with lofty roof; card-room, dining-room, kitchen, with men's rooms, usual offices, &c. The cost was £1,900. Messrs. Gregory and Co., of Clapham, are the builders, and Mr. Walter A. Williams, A.R.I.B.A., of Bromley, Kent, and London, is the architect.

A fire, attended with some degree of panic, occurred at the Birmingham Electrical and Industrial Exhibition last week, and its prompt extinction served to show the sufficiency of the means which the committee of the exhibition have taken to prevent danger from such a cause. The fire broke out in a structure built of wood and canvas, which enshrines what is termed the Egyptian Mystery. A paraffin lamp which plays some part in the deception was either upset, or by some means brought near enough to the canvas to cause it to smoulder. As soon as smoke was seen issuing from the place, a ready-witted boy broke the glass of one of the fire-call boxes which have been erected in the hall under the direction of Mr. E. L. Joseph, in connection with the exhibits of Mr. Julius Sax; and by manipulating the "call" he at once communicated with the fireman who has been put on duty in the hall. By an arrangement of the call-receiver, the signal-giver indicated the part of the building which the alarm came from, and the fireman was on the spot in a few seconds with a hand-pump. The work of extinguishing the flames occupied about five minutes.

At a meeting of the Court of the Carpenters' Company, held on Tuesday week, the medals and certificates were presented to the following successful candidates at the recent examination for foremen, or clerks of works, by the Master, Lt.-Col. Banister-Fletcher, J.P., F.R.I.B.A.:—First class certificates: D. W. D. Boxall (gold medal), H. Kent (silver medal), A. Whittier (bronze medal), S. Evans, A. D. Johnson, J. D. McNair, G. W. Chilvers, A. G. Morrice, and C. T. Aston. Second-class certificates: W. Benn and J. Hunt.

CHIPS.

Mr. R. Lofthouse, architect, of Middlesbrough, has been appointed diocesan surveyor for the Archdeaconry of Cleveland in the diocese of York.

During some alterations now in progress at the only wing yet remaining of the Charter House at Coventry some interesting features have been brought to light, including a pavement of encaustic tiles, fragments of window tracery and mouldings, and on the first floor the lower portion of a 15th-century fresco representing the Crucifixion; the upper part was destroyed many years since by the opening out of a window. The Charter House was described by Mr. W. G. Fretton in a paper published by the Birmingham and Midland Institute in 1874.

St. Martin's Church, Ludgate-hill, has been closed, having been condemned by the district surveyor as a dangerous structure. It is possible that the picturesque tower and spire, which form a quaint a feature of Ludgate-hill, may, under the circumstances, be demolished and the site covered by business premises, as steps are being taken for the union of the benefice with that of St. Mary Magdalen, Old Fish-street, which has already absorbed St. Gregory by St. Paul.

At the last meeting of the Wilts County Council it was proposed by a committee that the salary to be paid to Mr. Charles S. Adye, M.S.A., be £420 as inspector of roads and bridge master, and £200 per annum as county surveyor, the salary in both cases to include all out-of-pocket expenses. The matter was, however, referred back to arrange with Mr. Adye to place his entire services at the disposal of the county.

St. Cross's Church, Knutsford, is shortly to be enlarged by the addition of two new side aisles at a cost of about £1,000. The church was built in 18[illegible] at a cost of £4,000, and in 1887 the tower was added involving an expenditure of £1,300.

CHIPS.

The contract for the Liverpool Overhead Railway has been let to Mr. J. W. Willans, of Liverpool and Manchester. The undertaking is the first of the kind in England, though the overhead type of railway is well known in New York. The total length is about six miles, and the line will form a circuit round the docks, being carried on rolled girders, supported on cast-iron pillars. The line will be worked by electricity.

Chivelstone Church, near Kingsbridge, Devon, is to be restored. The church is in the Perpendicular style. The pulpit is a curiosity, being formed out of a solid block of oak richly carved; the screen is a beautiful specimen of carved work. Mr. A. Thorne, F.R.I.B.A., Barnstaple, is the architect, and Messrs. Samuel Farr and Sons, Kingsbridge, the builders.

The beauty of Workington Catholic Church has just been enhanced by the addition of six stained-glass windows, the gift of members of the congregation. The subjects are: St. Edwin, SS. Helen and Bridget, SS. Robert of Newminster and Jane Frances de Chantal, and the Angel Guardian, bearing in his arms a child. The windows were designed and executed by Messrs. Barnett and Son, of Leith, N.B.

New premises at Axminster have just been erected for the Wilts and Dorset Banking Company. The front of the building to the first floor is faced with Ham-hill stone. Above that it is built with T L B brick rubbers, the window openings relieved with Ham-hill stone. The building is from front to back about 64ft., and the frontage measures about 44ft. The work has been carried out by Messrs. Turner and Skinner, contractors, of Honiton, under the superintendence of the architect, Mr. G. M. Lilley, of Craven-street, Strand, London.

Sir Douglas Galton distributed, on Saturday, the certificates gained by the students in the Crystal Palace School of Practical Engineering. The report was read by Mr. Shenton, and showed an increased number of students, and that the successes have been numerous. The examiners of the term were Mr. H. V. Rudston Read, Mr. J. H. Cunningham, and Mr. Leonard Milne.

A new Baptist chapel in Fore-street, Okehampton, was opened last week. It is seated for 400 persons, and is lighted by electricity, being the first village chapel in the south-western counties in which the electric light has been adopted. Mr. Henry Green, of Okehampton, was the builder, and the outlay has been £1,300.

A new Sheriff Court-house at Hamilton, Lanarkshire, was formally opened on Friday.

The parish church at Stanton Drew was reopened on Friday by the Bishop of Bath and Wells after restoration. About £500 has been spent, principally upon the interior of the church. The old seats have now been removed and replaced by others in pitch pine. The organ and organ gallery, which had not been used for some years, have been altogether removed. A new stone pulpit has been provided as well as a lectern and screen against the Lyde Chapel. The sacrarium has been paved with glazed encaustic tiles; the altar raised, with a cross in burnished brass upon a new retable. There is one feature in the church which is peculiar, the old chancel had been surrendered into lay hands, probably some two centuries ago, and a new one added by its side. The exterior of the church has also been repaired. The work has been superintended by Mr. C. H. Lingen Barker, of the firm of Barker and Cross, architects, of Hereford and Weston-super-Mare.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

ANGLESEY, NEAR GOSPORT.—For the painting and decorating at Uxbridge House, for Mr. S. T. Blake. Mr. W. Yeardye, 30, High-street, Gosport, architect:—

Cave, A. M., and Co., Gosport ...	£125 0 0
Lear, C. J., and Son, Alverstoke ...	108 0 0
Pink, H., Gosport (accepted) ...	98 15 0

AUDENSHAW.—For the erection of a warehouse and offices, for the Audenshaw Paint and Colour Co. Mr. J. H. Burton, Warrington-street, Ashton-under-Lyne, architect:—

Clough, W., Ashton-under-Lyne ...	£495 0 0
Lowe, J., Hooley-hill	467 17 7
Gibson, J., Dukinfield...	445 0 0
Pike, Z., Hooley-hill	433 18 0
Underwood and Bros., Dukinfield ...	424 0 0
Booth, R. H., Stalybridge	422 0 0
Wallworth, C., Gorton	400 0 0
Davison, J., Manchester	399 0 0
Robinson, J., Ashton-under-Lyne...	379 0 0
Thornley, J., Hooley-hill	370 0 0
Holmes, A., Ashton-under-Lyne* ...	365 0 0
Rowland, H., Ashton-under-Lyne...	359 0 0

*Accepted.

BISHOPSTOKE.—For the erection of engine and carriage works at Bishopstoke, for the London and South Western Railway Co.:—
Lovatt, H., Wolverhampton (accepted) about... £150,000

BIRKENHEAD.—For renovations, &c., to the late Welsh Baptist chapel, Price-street, Birkenhead, to form same into a Salvation Army fortress, for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, E.C., architect and surveyor:—

Downham, J., Tranmere	£170 0 0
Legge, E., Son, and Co., Birkenhead (accepted)	134 6 0

BLAINA.—For the erection and completion of Salvation Army barracks, Blaina, Mon., for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C., architect:—
Morgan, T., Cardiff (accepted) ... £615 0 0

BOW, E.—For the erection of stabling for 64 horses, granary, harness rooms, loose box, and man's rooms, for Messrs. E. Cook and Co. Mr. H. Poston, 39, Lombard-street, E.C., architect. Quantities by the architect:—

Sykes and Son	£3,589 0 0
Norton, W.	3,129 0 0
Reed, A.	2,923 0 0
Morter, J.	2,927 0 0
Harris and Wardrop	2,723 0 0
Outhwaite, J., and Son	2,587 0 0

BOW, E.—For rebuilding premises and otherwise reinstating damage done by fire at the Imperial Saw Mills, Bow, E. Mr. H. Poston, 39, Lombard-street, E.C., architect:—
Morter, J. (accepted on schedule of prices).

CANNOCK.—For painting the offices of the local board:—
Benton, J., Hednesford (accepted) ... £39 0 0

CHATTERIS.—For the erection and completion of Salvation Army fortress in Chatteris, Cambs., for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C., architect and surveyor:—

Feast, J.	£430 4 3
Clarke, T.	421 13 6
Coxhead, F. J., Leytonstone ...	405 0 0
Shanks, R. (accepted)...	340 0 0

Rest of Chatteris.

CHATHAM.—For alterations and additions to premises situate in Green-street, New Brompton, to convert same into a Salvation Army Fortress, for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C., architect and surveyor:—

Burrows and Sons, Maidstone ...	£509 11 0
Skinner, E. C., Chatham	455 0 0
Hayward and Son, Bedford	398 0 0
Coxhead, F. J., Leytonstone ...	373 0 0
Martin, A., Battersea...	369 0 0
Jarvis, E., Banbury	359 0 0
West, G., Strood (withdrawn) ...	343 0 0

CREWE.—For alterations and additions to Methodist chapel, Market-terrace, Crewe, to form same into a Salvation Army barracks, for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C., architect and surveyor:—

Martin, Battersea	£675 0 0
Coxhead, Leytonstone (accepted) ..	650 0 0
Bereton, Crewe (too late)	525 5 0
Gresty, Willaston (too late)... ...	525 0 0

CAMDEN TOWN.—For alterations to 241, High-street, Camden Town, N.W., for the Home and Colonial Trading Association, Ltd. Mr. R. Willey, architect:—

Nightingale	£320 0 0
Rowe	295 0 0
Smith	270 0 0

DEPTFORD.—For alterations and additions to Wesleyan Chapel, Deptford, to form same into a Salvation citadel, for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C., architect and surveyor:—

Garner, A. and W., Peckham ...	£1,650 0 0
Castle, W. and H., Borough ...	1,647 0 0
Martin, Battersea	1,397 0 0
Coxhead, Leytonstone	1,024 0 0
Morgan, Wood Green	800 0 0
Doubleday and Son, Kingsland*...	780 0 0

* Accepted.

DEPTFORD.—For coffee-tavern and hall at Deptford to be given for public benefit by Mr. E. J. Preston. Mr. T. Dinwiddy, architect. Quantities by Mr. E. W. Stoner:—

Killby and Gayford	£2,470 0 0
Kirk and Randall	2,259 0 0
Morter	2,219 0 0
Rider and Son	2,158 0 0
Kennard Bros.	2,115 0 0
Holloway Bros.	1,950 0 0
Long	1,842 0 0

DRAYCOTT, DERBY.—For sewerage works at Draycot, Derbyshire, consisting of earthenware pipe sewers, iron pipe siphon, laying out a small sewage farm, &c., for the Shardlow Rural Sanitary Authority. Mr. W. H. Radford, A.M.I.C.E., Nottingham, engineer:—

Price, J. F.	£2,765 13 0
Hawley, J., and Son, Ilkeston ...	2,392 16 10
Vickers, H.	2,326 0 0
Smart, T.	2,239 18 0
Thumps, S.	2,185 16 6
Faulks, A., Loughborough ...	2,050 0 0
Tomlinson, J., Derby	1,989 0 0
Todd, G. F., Derby	1,905 0 0
Keeling, B.	1,850 0 0
Holmes Bros.*	1,845 0 0

* Accepted subject to a deduction of £350 for ashes not intended to be used.
Rest of Nottingham.

EALING, W.—For making good part of damage caused by fire at 30, High-street, for Mr. S. Dyer. Mr. G. A. Lean, 41, Broadway, Ealing, W., architect and surveyor:—

Nye, T.	£160 0 0
Jones, H., and A. G.	149 0 0
Adamson, T. H. and Sons	148 10 0
Bailey, A. (accepted)	140 0 0

All of Ealing.

EASTBOURNE.—For the erection of new casual wards, stables, &c., at the Eastbourne workhouse, for the guardians of the Eastbourne Union. Mr. F. G. Cooke, 3, Hyde-gardens, Eastbourne, and 6, Guildhall Chambers, E.C., architect. Quantities by Mr. A. T. Cooke, 6, Guildhall Chambers, London, E.C.:—

Peerless, J.	£2,190 0 0
Tomkinson, C...	2,028 12 0
Backhurst, W...	1,950 0 0
Cornwell, E., and Son	1,946 0 0
Huggett and Pattenden	1,935 0 0
Stanbridge and Supper	1,919 0 0
Rollason Bros.	1,897 0 0
Coster, J. (accepted)...	1,820 0 0

All of Eastbourne.
Architect's estimate, £1,800.

EAST DEREHAM.—For supplying and laying about 4,500yds. of artificial stone pavements, with stone kerbing, granite channelling, &c., for the local board. Mr. F. W. Skipper, surveyor:—

Imperial stone:—	
Blyth, Foulsham	£2,433 9 5
Metallic paving:—	
Patent Paving & Construction Co.	2,420 4 3½
Granite slabs:—	
Homan, E., London	2,169 4 3
Granolithic paving:—	
Stuart's Granolithic Co.	2,198 0 0
Croft adamant:—	
Bell, G., Tottenham...	1,998 5 9
Victoria stone:—	
Victoria Stone Co.	1,971 7 7
Silicated concrete:—	
Newell, J., East Dereham ...	1,947 6 3
Imperial stone:—	
Imperial Stone Co.	1,763 2 3
Jones's annealed flag paving:—	
Mayes, R., East Dereham	1,731 6 10
Imperial stone:—	
Hubbard, W. D., East Dereham*	1,725 17 4½
Indurated stone paving:—	
Patent Indurated Stone Co. ...	1,617 7 11
Indurated paving:—	
Lewis, Griffiths, and Co., London	1,498 10 1

* Accepted.

EDINBURGH.—For erecting the S. S. C. Library buildings. Mr. J. B. Dunn, 94, George-street, Edinburgh, architect. Quantities by Messrs. Brown and Walker, Frederick-street, Edinburgh:—

(Accepted tenders.)

Mason:—	
M'Gregor, W. and D.	£7,716 0 0
Carpenter and joiner:—	
Beattie and Son, Fountainbridge...	3,729 0 0
Plumber:—	
M'Donald, J....	809 0 0
Plasterer:—	
Condon, E.	1,050 0 0
Slater:—	
Graham, R.	69 0 0
Steel and iron-work:—	
Mather and Son, Fountainbridge	1,003 10 0
Concrete work:—	
Stuart and Co.	337 0 0
Glazier:—	
Dickson and Walker	412 0 0

Rest of Edinburgh.

Exeter.—For extensive alterations and additions to the Salvation Army Temple, The Friars, Exeter, for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C., architect and surveyor:—

Westcott, J., Exeter	£1,995	0	0
Coxhead, F. J., Leytonstone ...	1,980	0	0
Morgan, T., Wood Green	1,900	0	9

Farnworth.—For the erection and completion of citadel buildings in Farnworth, for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C. architect and surveyor:—

Haywood & Son, Bedford... ...	£1,775	0	0
Coxhead, Leytonstone	1,539	0	0
Taylor Bros., Farnworth*... ...	1,300	0	0

* Accepted.

Gosport.—For exterior alterations to the Bank, High-street, for Messrs. Grant, Maddison, and Co., Ltd. Mr. W. Yeardye, 30, High-street, Gosport, architect:—

Jupe, C.	£177	0	0
Croad, J....	169	10	0
Lowe, W., and Son (accepted) ...	121	0	0

All of Gosport.

Hackney.—For alterations to 303, Mare-street, Hackney, for the Home and Colonial Trading Association, Ltd. Mr. R. Walley, architect:—

Nightingale	£349	0	0
Hayward	310	0	0
Row	298	0	0

Lawsmoor.—For alterations and additions to Salvation Army barracks, Lawsmoor, Worcester, for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C., architect:—

Morgan, T., Wood Green (accepted) £368 0 0

Leeds.—For the erection and completion of citadel buildings in New Wortley, Leeds, for the Salvation Army. Mr. J. W. Dunford, 101, Queen Victoria-street, E.C., architect and surveyor:—

Cressey, H., Leeds	£1,146	0	0
Coxhead, F. J., Leytonstone ...	1,000	0	0

* Accepted.

Littleport.—For the erection and completion of Salvation Army fortress, Littleport, Cambs., for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C., architect:—

Summerlee, T., Littleport (accepted) £348 0 0

Liverpool.—For alterations, &c., to the skating rink, Pembroke-place, Liverpool, for the Salvation Army. Mr. J. W. Dunford, 101, Queen Victoria-street, E.C., architect and surveyor:—

Morgan, Wood Green (accepted) ... £350 0 0

Liverpool.—For painting the courts at St. George's Hall, for the city council:—

Merrick, W. (accepted) £330 0 0

Liverpool.—For executing concrete work to steps, landings, sills, and floors in labourers' dwellings in Juvenal-street, for the city council:—

Reldif, J. (accepted) £331 7 6

Liverpool.—For renewing a portion of the ceiling of St. Martin's Church, for the city council:—

Rudd, T. W. (accepted) £99 0 0

Liverpool.—For the laying of pipes for the Vyrnwy Aqueduct on the north and south sides of the river Mersey, for the city council:—

Fotherby and Son, Burnley (accepted).

London.—For sundry fittings at the International headquarters of the Salvation Army, 101, Queen Victoria-street, for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C., architect and surveyor:—

Scheme A.:—

Martin, Battersea (accepted) ...	£237	3	7

Scheme B.:—

Coxhead, Leytonstone (accepted) ...	93	0	0

Scheme C.:—

Mannering, Adam-street, W.C. ...	232	15	0
Coxhead, Leytonstone	202	0	0
Martin, Battersea	192	0	0
Morgan, Wood Green...	175	0	0

London.—For repairs to be done at the Licensed Victuallers' Asylum, Asylum-road, Old Kent-road, for Mr. A. L. Annett, secretary. Mr. W. F. Potter, architect:—

Hayworth, S., and Sons, Kingsland	£269	0	0
Baker, G., and Co., Milton-street ...	228	7	0
Wells, W., Paddington	179	0	0
Cook, B., Stonecutter-street, E.C....	169	0	0
Wythe, W., Dalston	150	0	0
Walker, J., and Sons, Poplar* ...	127	0	0

* Accepted.

Ludlow.—For new bell, framework and fittings for bells in the belfry of St. Lawrence's Church tower, Ludlow:—Taylor and Co., Loughborough (accepted) ... £309 4 0

Lye.—For the erection and completion of Salvation Army fort and fortress at Lye, Wor., for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, E.C., architect and surveyor:—

Weale and Co., Ludlow (accepted)... £590 0 0

Manningtree.—For the erection and completion of Salvation Army fortress in Manningtree, Essex, for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C., architect and surveyor:—

Martin, Battersea	£560	0	0
Gladwell, Walton-on-the-Naze ...	354	10	0
Coxhead, Leytonstone	347	0	0
Capon, Manningtree	337	13	6
Sargent, Gt. Clacton	320	0	0
Jarvis, Banbury (accepted)	248	0	0

Millom.—For the erection and completion of Salvation Army fortress in Millom, Cumberland, for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, E.C., architect and surveyor:—

Tomlinson, W....	£785	17	9
Bradley, W.	689	16	4
Mitchell, E. (accepted)	625	0	0

All of Millom.

Montrose.—For fitting up electric lighting apparatus throughout the lunatic asylum:—

Muir, Mavor, and Coulson, Glasgow (accepted)... £1,345

Northampton.—For a new council-room at the shire hall, for the county council. Mr. Law, county surveyor: Seven tenders received. Highest, £4,191; lowest from Mr. J. T. Wingrove, Northampton, £2,846. After revision of plans the latter tender was accepted at £2,346.

Northwich.—For repiping the town, and carrying the mains over Dane Bridge, for the local board:—

Sharp and Cruickshank	£1,721	17	10
Dawson, H.	1,384	7	7
Turner, T.	1,306	14	6
Swinton, J.	1,177	9	9
Hughes, F. W.	1,157	16	2
Pickthall, J. W.	868	15	7
Dale, J.	837	2	11
Pickthall and Son (accepted) ...	736	15	8

Oswestry.—For the construction of a reservoir keeper's cottage, two workmen's cottages, whim shed, workshops, roads, and fences at Oswestry, for the Vyrnwy water supply committee of the Liverpool city council:—

Davies Bros., Wrexham (accepted) £4,791 2 2

Parc Uchaf.—For the erection of a cottage and whim shed, for the Vyrnwy water supply committee of the Liverpool city council:—

Davies Bros., Wrexham (accepted) £1,391 9 10

Penarth.—For the erection of a shop in Glebe-street, Penarth, for Mr. D. S. Johnston. Mr. H. Cornish, M.S.A., architect:—

Edmunds, J. C....	£1,158	0	0
Speed, F....	997	11	0
Jones, J.	875	0	0
Price, R., Cardiff	825	0	0
Tape, M. H. (accepted)	785	0	0

Rest of Penarth.

Stepney.—For alterations and renovations to late Methodist chapel, Jubilee-street, Stepney, to form same into a Salvation Army fortress, for General Booth. Mr. J. W. Dunford, 101, Queen Victoria-street, London, E.C., architect:—

Wood, Tabley-road, N.	£276	0	0
Martin, Battersea	252	0	0
Coxhead, Leytonstone (accepted) ...	203	0	0

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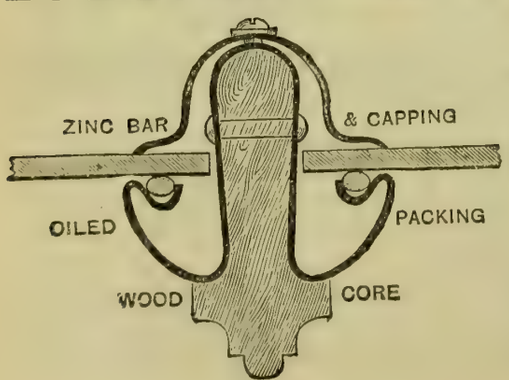
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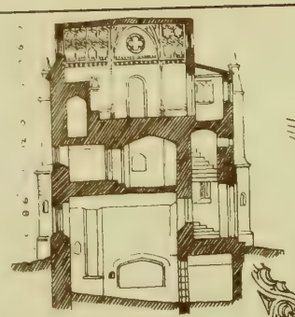
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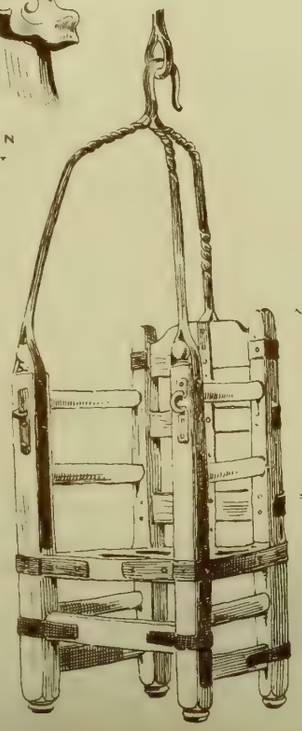


A BENCH END
S MARGARETS LYNN
ARNOLD B MITCHELL DELT



SECTION E-D

See "Building News" DEC 29 1882

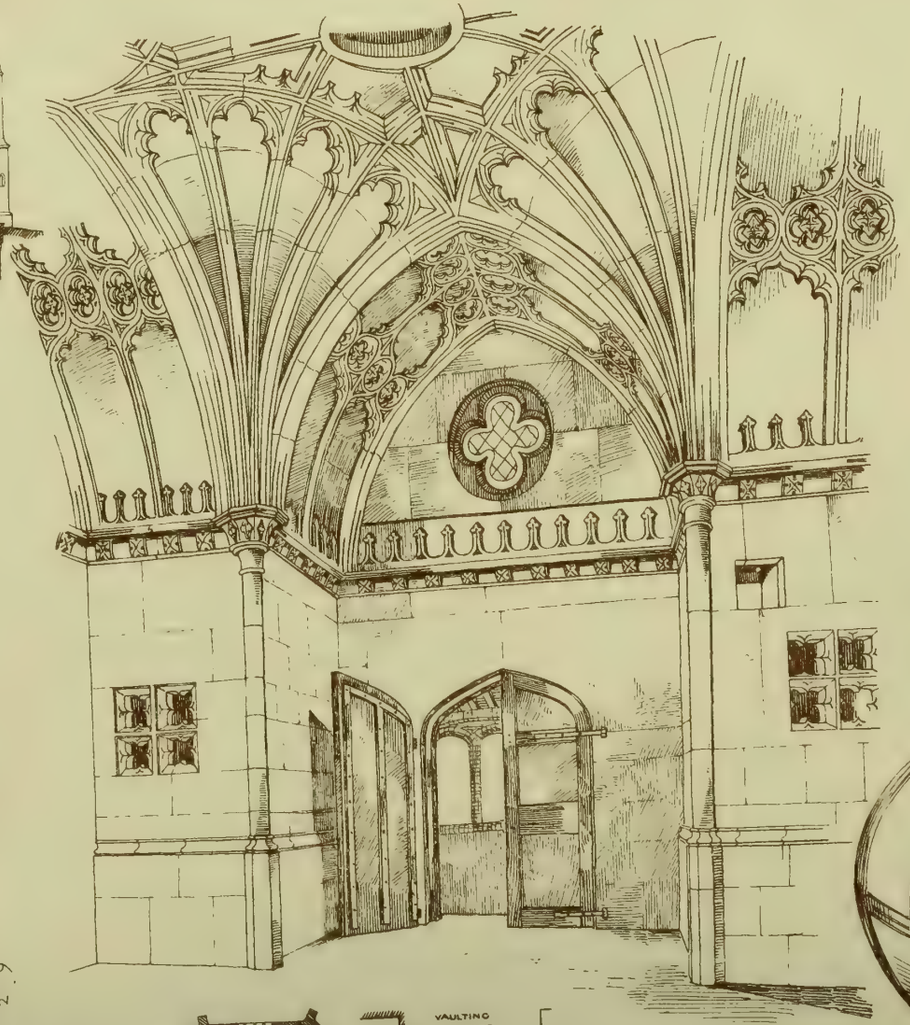


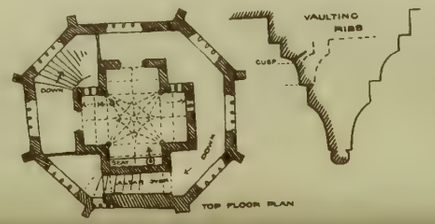
DUCKING CHAIR
IN THE
KINGS LYNN
MUSEUM

SKETCHED BY
E GUY DAWBER



SEAT



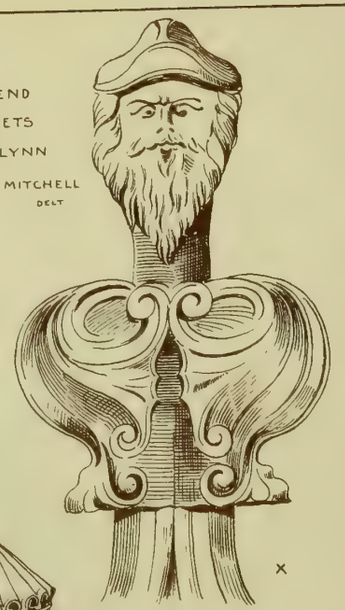


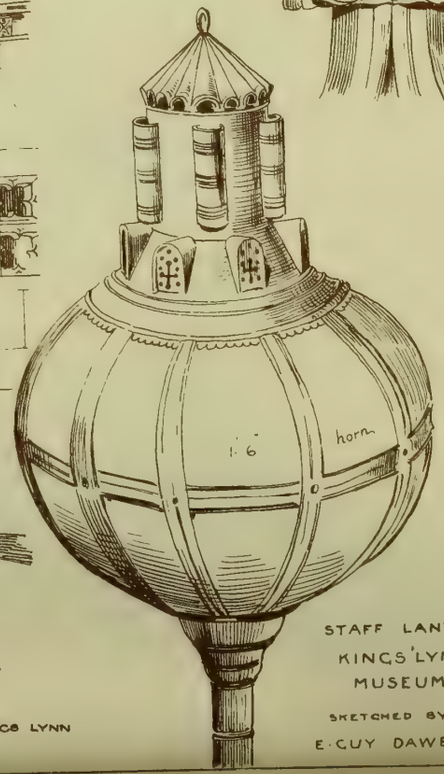
TOP FLOOR PLAN

BUILT A.D. 1484-5 SURROUNDED BY AN OUTER BRICK SHELL, CONTAINING TWO DISTINCT WINDING STAIRCASES; SIZE OF CHAPEL 17'7" x 14' 0" INTERNAL, AND 13'0" TO APEX OF VAULT

CHAPEL OF THE RED MOUNT, KINGS LYNN
ARNOLD B MITCHELL del.

A BENCH END
S MARGARETS
KINGS LYNN
ARNOLD B. MITCHELL
DELT





STAFF LANTERN
KINGS LYNN
MUSEUM
SKETCHED BY
E. GUY DAWBER

Photo-Lithographed & Printed by James Akerman 6 Queen Square W.C.

Bench in Nave.
Wiggenhall St Mary's Church.
Norfolk.

There are about thirty various bench ends in this Church nearly all different in detail and treatment. Many have instead of a figure in the centre the arms of the Kerrilles who lived in the village in the 15th and 16th centuries.

Section thro' Seat

Elevation of Bench End.

Book Board
Seat
Floor of Seat
Floor of Church

Side Elevation.

Poppy Head
Detail of upper portion
Decoration on Uprights

Section

A

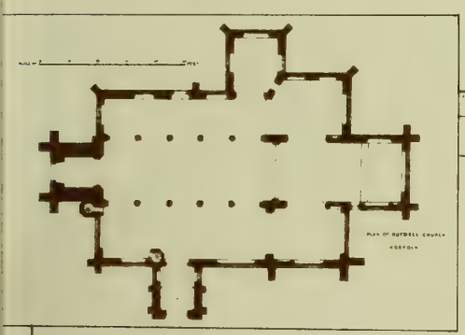
Plan at A.

Centre Line

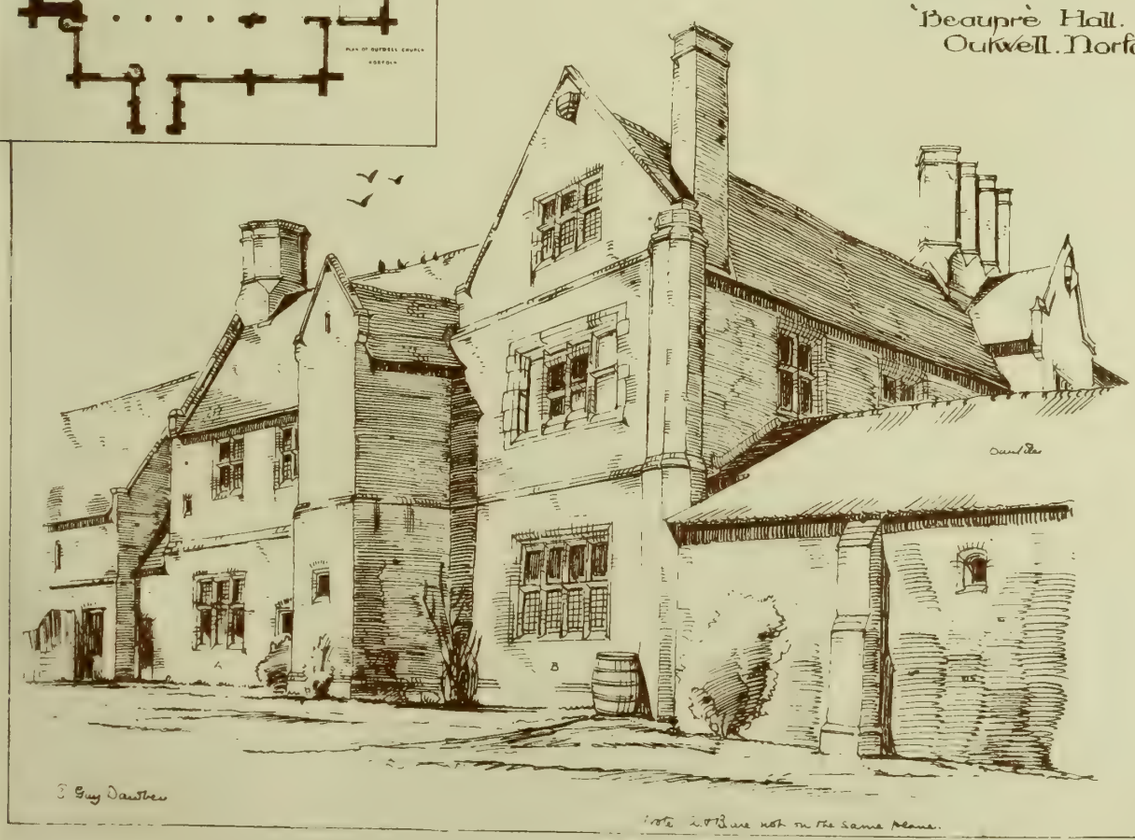
Base mold

Note. Re-drawn from pencil sketches made on the Spot.

J. Guy Dawber



Beaupré Hall.
Outwell. Norfolk.



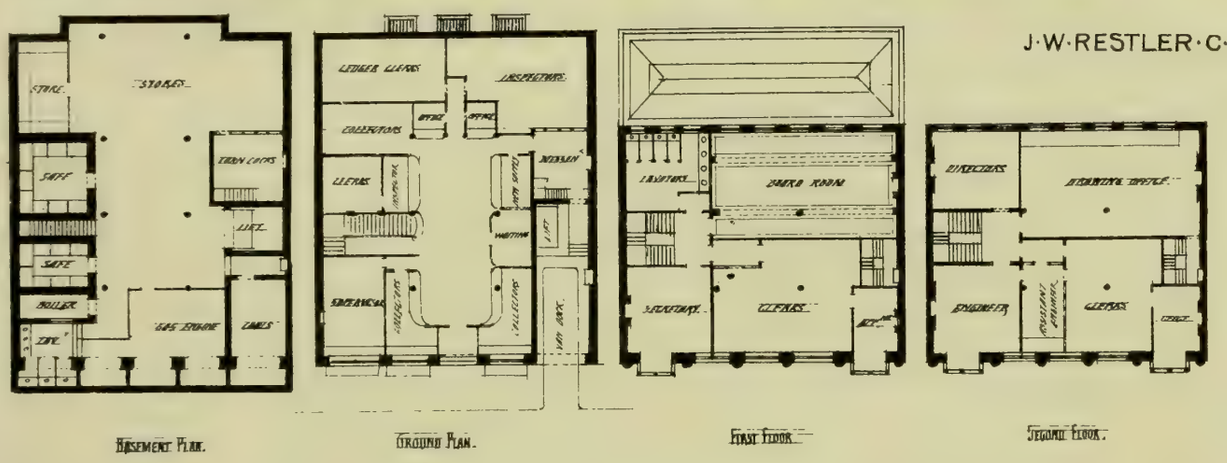
J. Guy Dawber

Note. Doors not in the same plane.

Photo-Lithographed & Printed by The Avenue, 6 Queen Square W.C.

NEW OFFICES SOUTHWARK & VAUXHALL WATER COMPANY. SOUTHWARK BRIDGE ROAD.

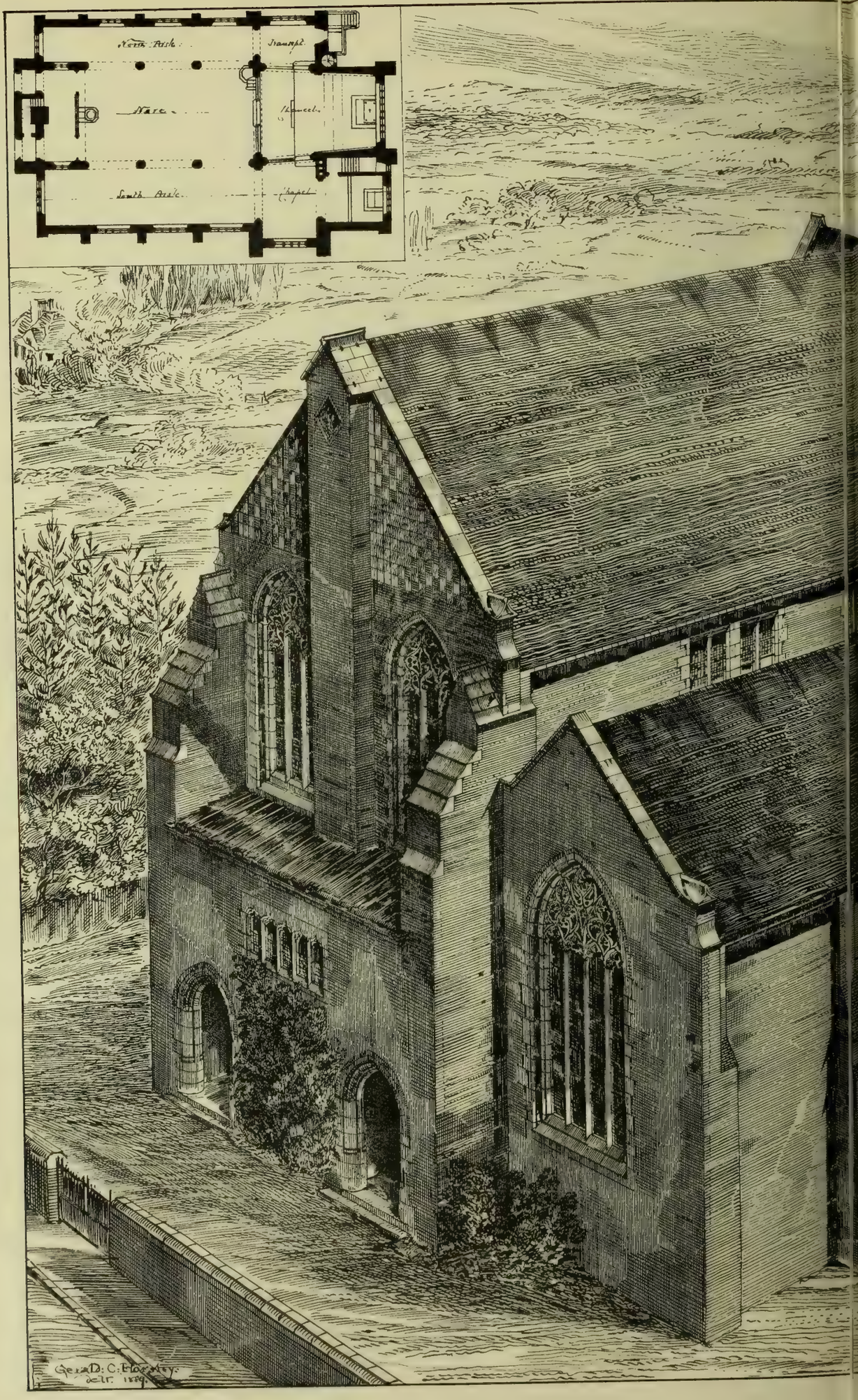
J.W.RESTLER.C.E.



BASEMENT PLAN. GROUND PLAN. FIRST FLOOR. SECOND FLOOR.



Photo Lithographed & Printed by James Akerma[illegible] Queen Square W.C.


North Aisle
Transept
Nave
Chancel
South Aisle
Chapel
Gerald C. Horsley
delt. 1889.

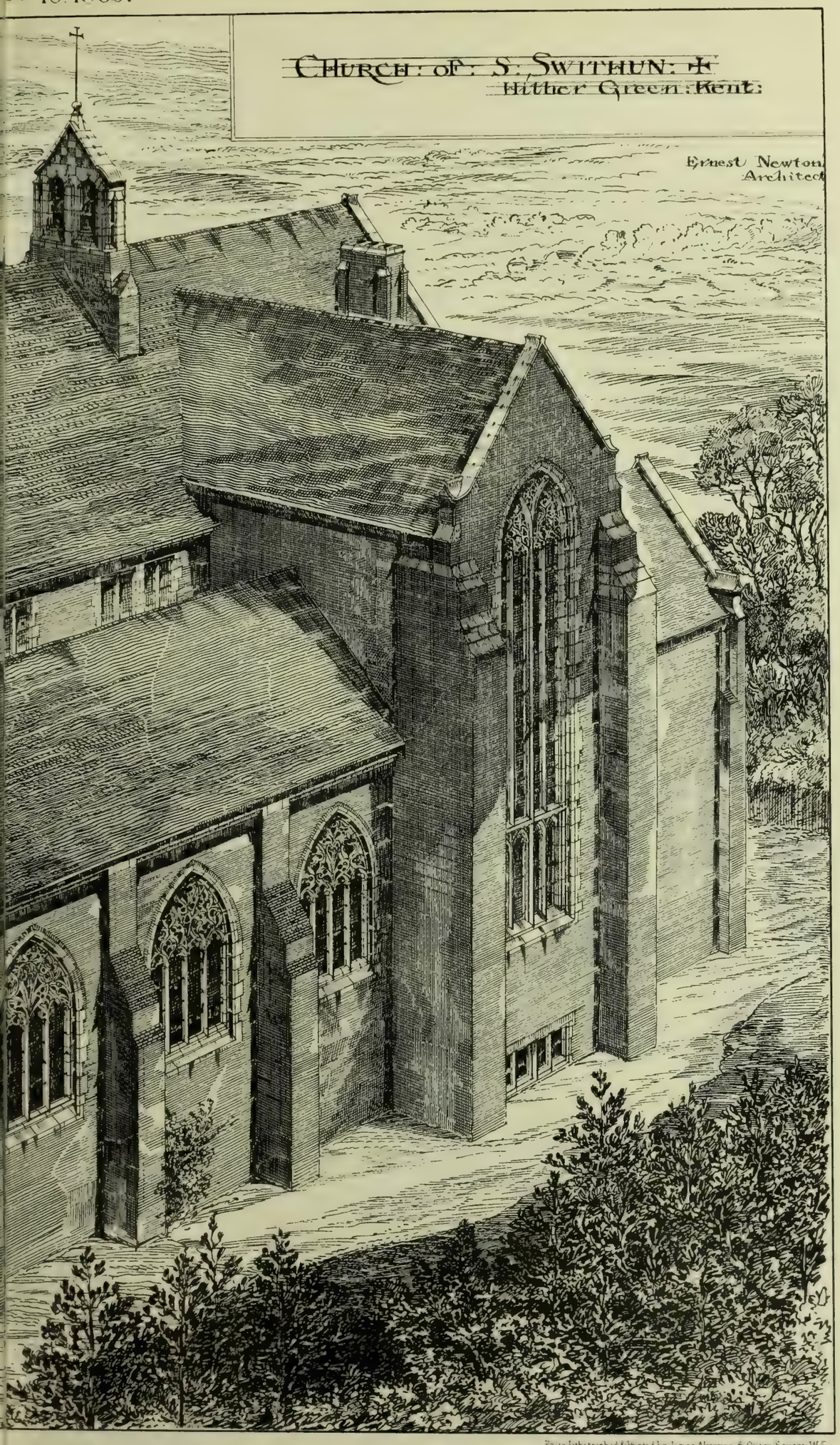
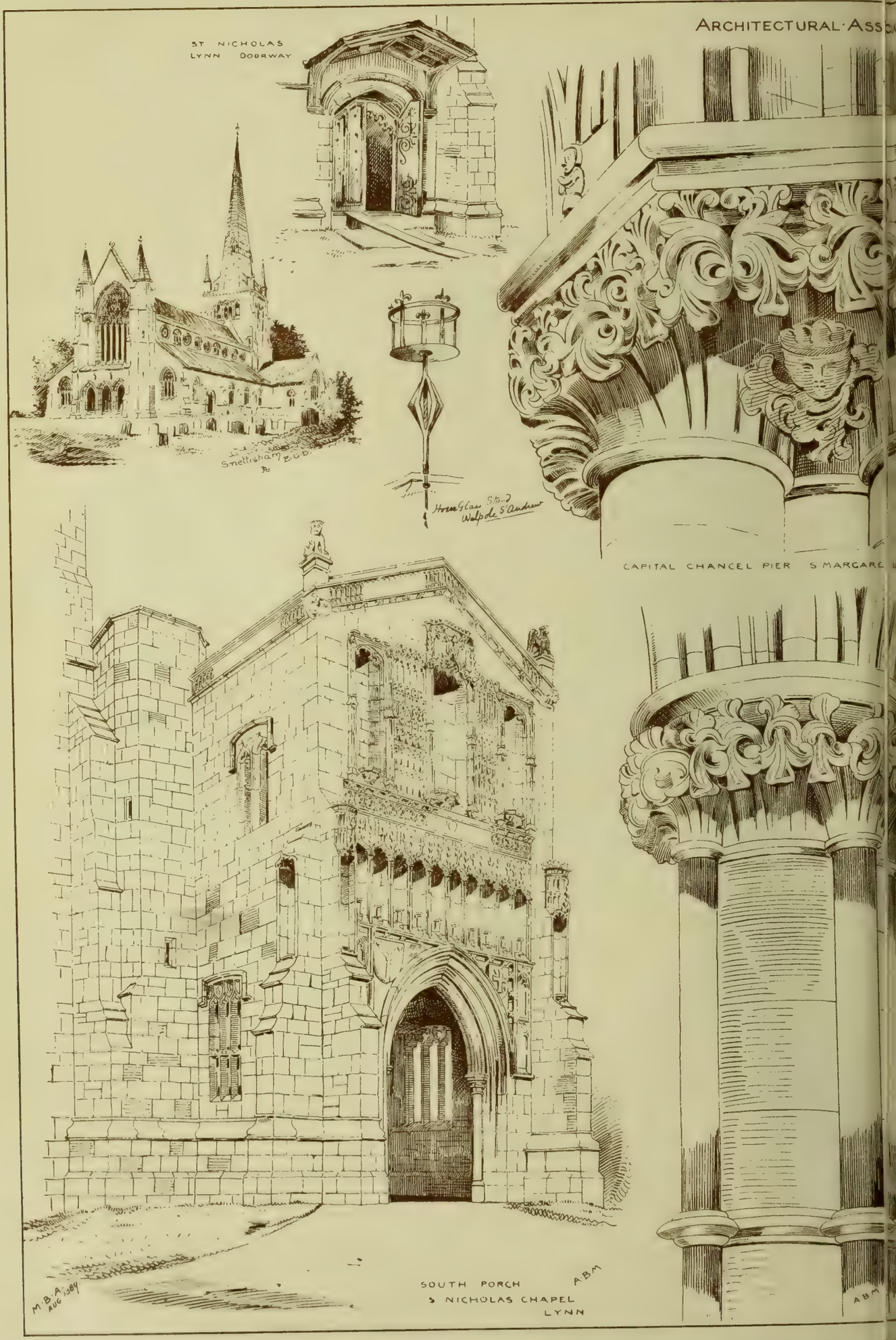


Photo lithographed & Printed by James Akerman 6 Queen Square W.C



SKETCHES ROUND

BY ARNOLD B MITCH

ON · EXCURSION · 1889





ALMSHOUSES CASTLE RISING
NORFOLK



A POPPY HEAD
S NICHOLAS LYNN.
NORFOLK



PIER
ALTON
RCH
FOLK



BENCH END
S NICHOLAS CH
KINGS LYNN



WEST TOWER
TILNEY ALL SAINTS
NORFOLK

LYNN NORFOLK

Photo-lithographed & Printed by James Akerman, 6 Queen Square W.

GUY DAWBER

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1807.
FRIDAY, AUGUST 23, 1889.

ARCHITECTURAL STUDY.

EXTRAORDINARY advances have been made in the study of architecture since the days of John Nash and Augustus Pugin—the first the promoter of modern street architecture and fashionable edifices at Brighton and elsewhere, the latter the pioneer of Gothic and the author of the "Specimens." At that period architecture was a fashionable "taste" among the upper classes, acquired more from a few books than an earnest study of buildings. The author of "Contrasts" and "True Principles" had begun to show the reality and thoroughness of his favourite style. Wilkins and Sir Charles Barry were carrying out buildings like the National Gallery and the Travellers' and Reform Club-houses, imbued with opposite principles of design, and several of the leading architects of the present century, including Harvey Lonsdale Elmes, the designer of St. George's Hall, Liverpool, Augustus Welby Pugin, Charles R. Cockerell, Smirke, Hardwick, and Tite, followed in their respective schools. Yet the actual knowledge then possessed of great epochs and examples was exceedingly scanty, and it is curious to turn from the treatises and lectures of those days to the literature of the present time. One peculiarity in the style of these books was its essentially didactic character; the authors of treatises on Greek and Gothic architecture delivered their opinions with dogmatic firmness, and each style and class of building was described in the most formal manner, as if every element had been rigorously classified and laid down with grammatical precision. There was no room to doubt the characteristics of any one style, or to imagine that further discoveries and explorations would one day considerably modify and alter the opinion then expressed. Consequently it came about that styles were looked upon as distinct and cut-and-dried species based on a few typical buildings. Limited as the number of specimens were representing each style, it was impossible to give more than a narrow and circumscribed description of each. It followed that churches were built in imitation of certain Greek examples, and domestic buildings were designed upon an unalterable formula derived from the precepts of Vitruvius, Palladio, and their disciples. One result of this teaching was very apparent in the application of the system of columniation to every building of importance. Criticism was generally directed to find any errors in the proportion of the "orders" used, and if no precedent could be found, the design was mercilessly attacked. How badly some of our recent buildings in the Classic or Renaissance styles would fare if this rule were applied to them, it would be shocking to think of. Hardly one of the designs for the War and Admiralty Offices would pass through the ordeal. In many of the old authors on Italian architecture rules and directions are given for composing façades, proportioning rooms, windows, and other features. Nicholson and Batty Langley prescribed in this manner, and it was clearly thought that the style was inseparable from certain types of structure. This idea has been exploded. Style is now understood in a much wider sense, not identical with the habiliments of certain buildings, but as the outgrowth or expression of a certain manner of adapting materials. Dogmatic treatises on orders and the composition of façades find no longer the passive student. A man who select a style no longer feels inclined to follow a certain model, but selects it because it serves to express his requirements, and suits the material at his command.

Upon the same ground detail was copied, and no attempt was made to search for principles, or to understand the spirit in which it was executed. Even Pugin's "Specimens," admirable for their laborious execution and accuracy, were examples culled from various Gothic buildings, and taken from their context in the work. Their relation to the edifices they belonged to was not shown; in fact, they were like the dried specimen taken from a tree or a flower. The younger Pugins laboured nobly to redeem this mistake of their contemporaries, and the work on "Contrasts," or a parallel between 14th and 15th-century edifices and the present day, and the "True Principles of Pointed Architecture," published in 1841, are written in a broader and more scientific spirit with the object of determining the hidden principles and motives of the old builders, while this line was followed by F. A. Paley, E. Sharpe, and others, who tried to discover the proportions and geometrical principles on which the Mediæval churches were based. When we compare the earlier works on Gothic architecture, which were generally nothing more than examples, as Britton's "Antiquities of Great Britain," with the writings of Scott, Viollet-le-Duc, and Ruskin, to say nothing of later writers, we perceive at once the greater grasp obtained, the wider and more generalised conclusions which were arrived at by them. As an instance, take, on the study of Gothic architecture, Parker's "Glossary," or Rickman's "Attempt to Discriminate," and compare these treatises with the late Sir G. G. Scott's "Lectures on the Rise and Development of Mediæval Architecture," we shall find how different is the handling. The former were describers and classifiers merely of old buildings as they appeared; their authors were like those early writers on natural history or zoology who described what they saw without attempting to arrange the various orders, genera, and species of the organic world; but the latter did not stop at bare description of dead specimens; they endeavoured to explain the adaptation and evolution which accompanied the history of the styles, regarding them as transitional stages merely in the growth of structural requirements; and in this way they did for architecture what Darwin and Spencer have accomplished for the great departments of natural history and biology. When we read Viollet-le-Duc, Fergusson, Scott, and Sharpe we no longer study the art as dry archæology, but trace the steps of a great structural development, read buildings in the light of contemporary science and historical research. The whole subject is treated like a science. The authors have thrown a varied light on their subject, which is more than the account of mere buildings of stone or brick: they have revealed, in development of structure, the operations of various mental states and conditions of national and social life. In his lectures, Scott, like Le Duc, takes the student through different stages of Mediæval architecture; shows how the vaulting system of the Middle Ages arose and was developed from plan; how tracery grew from simple forms, that mouldings were no exceptions to the law of growth. This spirit of inquiry and this mode of treating architectural progress or style was exemplified also in the works of Willis, in Sharpe's "Parallels," and the "Seven Periods of Gothic Architecture," and in F. A. Paley's "Gothic Mouldings." The law of intention and motive, as controlled by material, or the principle of evolution, is uppermost in each of them.

Interesting as this inquiry is, it would lead us too far to give actual examples; we may therefore confine our remarks to one old book, dated 1823, entitled "Elmes's Lectures on Architecture." This work, written by an architect who enjoyed a large surveying and general practice, was dedicated to George IV., "the enlightened patron and protector of the British School of Art," as he is called. One of the first things that strike us in opening these Lectures is their comprehensive character, comprising as they do the whole history of the art from the antediluvian to modern times. This ambitious review of architecture, which commences from the Books of Moses, did not in the least give rise to any doubts or difficulties. Authors in those days began their histories with our First Parents, and never thought that it would be more satisfactory if they gave a more limited survey. Recent discoveries and research have made historians more modest, and art histories, as now written, generally confine themselves to certain epochs, or deal with distinct styles. Of what need was there to dwell on ages about which written history was all fable, surmise, and conjecture? Thus Elmes writes: "The history of the ages before the Deluge furnishes but few materials for the history of architecture." As if, forsooth, anything at all was known. More amusing is it to be told that the "Deluge is daily becoming more a matter of proof from the continual discoveries of fossil remains," and to read quotations from old writers like De Goguet and Sir William Jones bearing upon this terrible visitation. These well-meaning writers drew their conclusions too frequently from mere fable, and had not the higher and more scientific proofs upon which those events are now supported. So in regard to architecture, discoveries have set at rest or exploded theories of origin, such as the pretty-fabled story of the Corinthian Order, or the origin of the Gothic arch. The ancient records were necessarily derived from the Hebrew Bible, from Homer, and Pliny; but these sources are now supplemented by many additional new lights. Modern discoveries have helped us to form more correct ideas of the origin of Greek art than we could have done from passages in the "Iliad" and "Odyssey"; rude stone monuments have been interpreted. Schliemann, in his researches at Mycenæ and Tiryns, has thrown much light on early Greek architecture. His explorations on the site of Troy have led to even greater results in the knowledge of Greek art. Affinities have been discovered between styles which were once thought to be distinct. For example, the fortress discovered by Dr. Schliemann at Tiryns is important as showing that the great propyleum or gate is a prototype of the later Greek propylæa at Athens. Vitruvius's description of the Greek dwelling-house has also been borne out by the discoveries at Tiryns. Dr. Dorpfeld says this agreement is striking, and is an important proof that the plan of the late historical Greek dwelling was developed from the Homeric dwelling-house. Fergusson has traced many likenesses between Indian and other forms of construction, and this correspondence has indicated a continuity of types which our forefathers had not the means of showing. Elmes does not allude to the wooden prototypes which gave a decided individuality to Indian examples, but traces the style to caverns and excavations in rock, and rather connects the subterraneous temples with the Egyptian and Persian edifices. In this conjecture he is partially right, for it is pretty well established that the constructed temples partook of excavated or sculptured rock forms. Persepolitan types are certainly traceable in Indian temples.

Although the older writers on architecture were disposed to accept contemporary statements, as those of Sir W. Jones, too implicitly, some of their hypotheses were true, and have been borne out by recent researches. Thus, in speaking of Chinese architecture, Elmes says "tents and pavilions appear to

have been the original types," and this origin cannot be disputed. The Chinese and Tartar tribes were essentially nomadic in their habits. He alludes also to the police laws or regulations, which prescribe, with the greatest nicety, how buildings for every rank are to be erected, from the simple citizen to the mandarine or grandee of the empire—a law which has produced great uniformity in the houses, both in plan and design. Dimensions for every part, and the number of courts and rooms are prescribed. Moreover, there are many general reflections in Elmes' Lectures which we can accept as showing that even under the rules of the later Georges true conceptions of architecture existed, though we are bound to discount a great deal of the flattery which the author bestows on George III. He says of the style called the Classical: "The art was then all but lost in the dark and tasteless days of Georges I. and II., till it revived under George III., in Chambers, Wyatt, and Stuart, and appears now, like its sister-art of painting, still in its progress towards a great and glorious meridian of perfection. To our late venerable sovereign the arts are all deeply indebted, and architecture not the least. Possessed of a sound and pure taste himself, initiated early in life in its elementary principles, both of design and construction, his judgment was guided by his knowledge, and the names of his architects, Chambers, Wyatt, and Stuart, and the purity of the style which he patronised, are proofs of the accuracy of his discernment and the excellence of his taste." No doubt that monarch did more than his immediate predecessors to foster art, though we cannot allow that the days of the Third George can rank with those of either Pericles or Leo X., Julius II., or Charles I., or that George IV. can be bracketed with the names of either of those benefactors of the arts. At the same time, we cannot forget that it was in George III.'s reign, and during the Regency, that a large sum of public money was expended in the purchase of the Townley, Elgin, and Phigaleian marbles, a contribution towards the arts that deserves to be gratefully remembered; and this generous impulse of the Government of that day was a fitting tribute to the nation after a period of unexampled conquest. Again, the same author had a very keen sense of the advantages and disadvantages of architecture as a profession, though competition was not nearly so severe as it is now. He says, "Architecture has this manifest advantage over painting, which, to a student in choice of a profession is by no means a contemptible one, that while in painting one must be superlatively great, or positively contemptible; in architecture there are many grades below its highest (which in sublimity yields not to painting) wherein industry and talent, below the brilliancy of genius, may occupy a moderate station with much dignity and use to society." A recommendation as neatly worded as it is inoffensive. But, as he says, the art "is not like painting, a marketable art. The architect cannot, like the painter or the sculptor, complete his works in private and exhibit them in public; he cannot carry a cottage under his arm, a villa in a Hackney coach, or a palace in the more magnificent appendages of a porter's horse and two livery chairmen, to an exhibition for his credit or for sale. For him there is no British Institution for the sale of his work, no auctions with public or more select and fashionable private views. His designs, without patrons, must lie neglected for years in his portfolios." We have reflections, too, on the connection of architecture with the laws, government, and manners of different nations. Though a general relation between art and the history of the human mind is hinted at, it is not made the thread of the narrative. Such a treatment was reserved for a later time. General notions of how architecture expressed mental characteristics prevailed, but no one thought of taking this as one of the factors in the development of the art.

RESTRICTIVE COVENANTS — WHY THEY ARE NOT ENFORCED.

ARE these generally enforced, and in how many cases are they introduced in leases to get a respectable class of buildings erected? We have so many instances of estates where these covenants are not strictly carried out that their insertion in leases is not regarded with that amount of respect which they ought to receive. Acted upon, they are the chief guarantee the lessee has that the estate will be maintained in a respectable manner, that no objectionable businesses or shops will be opened or carried on to the annoyance of residents. Lately the question has been revived in connection with the proposals for the enfranchisement of leaseholds. The opponents of enfranchisement have laid much stress on the value of restrictive covenants, and have argued that if tenants have the power given them of purchasing the freehold of their houses, they would refuse to be tied down by these covenants, and would, by making alterations of an objectionable character, become a nuisance to their neighbours. There would be some truth in this assumption, if there were no means of checking the vagaries of small freeholders, or making them amenable to the jurisdiction of local authorities. Those who uphold leasehold as a tenure are ever ready to advance this argument, even although as a matter of fact restrictive covenants are not always introduced or are imperfectly carried out by landowners. The fact is, however, the advocates of enfranchisement have their answer, and the Bills in Parliament propose means to enforce covenants, either through the local authorities, who are the properly constituted guardians of the public rights, or by providing that the original restrictive covenants shall be enforced by the individual who had the original right to enforce them. Mr. Lawson's Bill, for example, proposes this mode of continuing the obligation of the lessee. A distinction is drawn between trivial covenants and those of a necessary and beneficial character, and a wide discretion is given to the local authority so that they may be empowered to enforce any covenant they think necessary for the protection and benefit of the neighbourhood. When we consider the inoperative effect of the restrictive covenants in leases, as these are generally construed by the surveyor of the lessor, the unequal and often one-sided opinions, the favouritism shown by landowners to one class of objectionable trades, we must arrive at the conclusion that the local authority is the proper and only power to enforce any restrictions necessary for the public protection and interests. We believe if restrictive covenants had been enforceable by public authorities, not one-half of the estates would have deteriorated as they have done. The evidence lately given before the Select Committee on this question is convincing. We have it upon the evidence of Mr. Boodle and others that evils have grown up under old leases, especially on the Northampton estate, against which covenants were of no avail. Nuisances had grown up in spite of restrictive covenants. Again, as to the impartial judgment exercised by placing the power in the hands of the local authorities, one witness of experience in estates said there would be no difficulty at all in enforcing beneficial covenants supposing the ground landlords were bought out, because there would not only be the surveyor but the members of the local board to decide which was right or which wrong. In the case of covenants under the landowner's surveyor there is no arbitration possible—his decision is final. The evidence submitted from Southport is very conclusive of the unsatisfactory operation of restrictive covenants. Mr. Ellis says, "When covenants are dispensed with, in nearly every case an increased ground rent is demanded, and very heavy costs are imposed upon the lessees"—in other words, the covenants can be relaxed by payment. The same witness said "his point is to rebut the 'Fish-shop-in-Belgrave-square argument.' These covenants are not made use of for the protection of the neighbourhood, for the neighbourhood is sacrificed; but they are made use of for the purpose of putting money into the lessor's pocket." Other witnesses proved the same thing—that it was the practice to exact fines for breaches of covenant; but we have only to take the case of leasehold estates near London and other towns to see for ourselves how objectionable businesses have been opened, and houses allowed to encroach in front of their neighbours, in the face of covenants, to see whether the "amenities of a neighbourhood" have been preserved.

The "restricted covenants" of the lessor are in many cases mere legal jargon introduced to draw lessees, and to enable the landowner to exact fines for breaches of covenant often trivial, though sometimes of very serious import to neighbouring tenants. It may be said that the lessee has his legal remedy; but practically the lessor is master, and can do much as he pleases, for it often happens that the lessor has power reserved to relieve any tenant from the obligations of the covenant. The decisions of the Courts have favoured lessors, moreover, at the expense of lessees. In one case the purchasers of an estate had all entered into a covenant not to use the houses otherwise than as private residences, nevertheless the vendor gave permission to one purchaser to open a school in his house, and it was held that this was not a waiver of the covenant in favour of another purchaser.

There is another class of property to which the respective covenant is seldom applied, namely, premises at the fag-end of the lease. At this time enforcement of the covenant is very necessary; but the fag-ends of leases are purchased by house jobbers, with the object of making as much as they can out of them. The houses fall into neglect and an insanitary state, and the ground landlords are willing to allow them to fall into this condition. In many cases the landlords are unable to compel these owners to comply with the covenants, or are not willing that the property should be thrown on their hands before the termination of the lease. Altogether there are many strong reasons why the local authorities are right parties to enforce restrictions. The reason why they do not interfere now is because they do not wish to saddle the lessee at the fag-end of the lease with expenses which ought to be borne by the ground landlord. Hence the disgraceful condition of many of the houses in the Metropolis. The landowners of these properties cannot be called upon to defray a penny towards their repair and sanitary improvement, and it is very hard and often useless to put the law into operation against the lessee who has only the "fag-end" of the lease, and is often only a man of straw. But when the owner of land and house are the same person, the authority would have power and reason to put the Act into operation.

LEVELLING.—XVII.

BUILDING OPERATIONS ON HILL SIDES.

IN finding the levels of ground of limited extent for building operations, the use of a levelling instrument may be superseded. Builders carry out their levelling operations by employing the bricklayer's level, a straight edged board with a plummet in the centre, or a spirit-level fixed on the upper edge. By adjusting this straight-edged level on peg

Fig. 34

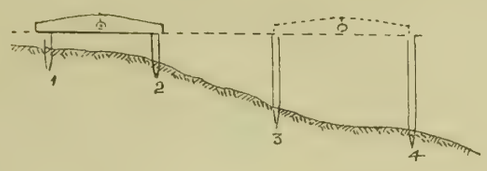


Fig. 35

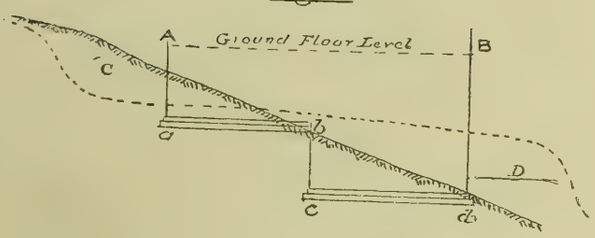
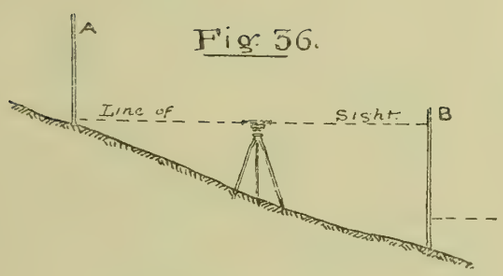


Fig. 36.



driven in the ground, till the bubble of spirit-level is in the centre of its run, a level line can be produced in any direction. Fig. 34 shows how the operation is conducted. Let us suppose it is required to set out the level of a ground floor in order to obtain the height of the brickwork necessary on sloping ground, and the depth below the surface to which the cellar has to be excavated. A peg, 1, is driven into the ground at the level it is required to fix the upper step of the entrance—say, at 2 or 3 steps from the surface. Another peg, 2, is driven in at a distance nearly the length of the level from the first, so that it may rest on them both, and is raised or lowered till the bubble is adjusted. A third peg, 3, is driven in at about the same distance, and the level again placed on the second and third, and adjusted level as before, by raising or lowering peg 3. This peg is in turn taken as a fixed point, and the other end of level is made to rest on a fourth peg, which is, as before, driven in the ground till the bubble again records a true level. This operation can be repeated for any reasonable distance with sufficient accuracy for building purposes, if care is taken that at each removal of the level the last peg is not touched after the bubble has been brought to the middle of its run. The peg to be raised or lowered must always be the last one put in. The diagram indicates the operation: when the level reaches its last peg, as shown by the dotted position of the instrument, the difference of level can be found by measuring the height from the ground surface to the underside of the level at that point, and deducting therefrom the fixed height of level at peg 1. To level the other side of house, peg 4 is made a fixed point, and the operation can be repeated from it in any direction. Thus, if the first series of pegs 1 to 4 represents the level of one end of the house, a series of pegs at right angles thereto from peg 4 will give the level of the front side of house. This practical method of levelling admits of little error, and the pegs being allowed to remain are convenient for measurement and reference. On a steep hill-side or sloped ground the requirements of the leveller in building are of primary importance.

Suppose a house has to be built on such a cliff as we often find facing the sea. Accurate levels have to be taken to find how much soil must be removed for the foundations and cellars. The height of the ground floor must be first determined as the datum from which the other stories have to be taken. Say there are to be two or three steps on the rear side of house, as at A, Fig. 35, then a considerable quantity of soil must be removed for the foundations on this side shelving to nothing on the other, if we imagine the footings to be on the level. The excavation in section would, in fact, be of the shape of a triangular prism, the foundation would have to be carried down 8ft. to 10ft. on the rear side, and be almost level with the ground on the front. A great deal of brickwork would be buried on the upper side of ground, to avoid which the foundations are often stepped, as in Fig. 35, which shows the foundation walls of a house situated on sloping ground, the footings being laid on step-levels, so as to economise the brickwork. In this instance the cellar is in front, *c d*, where the excavation required would be small, and the ground floor would be well elevated towards the front. The dotted line shows the formation level when finished. If the depth of building is great it would be expensive to keep the floor line at the highest level as here indicated, as this would entail a good deal of surplus ground in front to make up; it would then be advisable to half-sink the ground-floor level by half-excavating the back portion, and half embanking the front, as shown by parts C and D. This may be imagined by assuming the dotted line to be the level of ground floor, requiring a descent of steps to the ground floor of the house behind, and a few steps up in front. A section such as that of the diagram must be made in either case, to enable the floor line to be regulated, and the amount of excavation and embanking to be found. The most advisable course to adopt is to make a platform for the building to stand upon, partially sunk by half-cutting, and partially raised in front by embanking, as shown by the dotted line in the figure. This platform can be extended for some distance all round the house, and be finished by embanking the ground in the manner shown. Considerable earthwork would be involved in the formation of this platform, and the first thing to do is to take the levels. It would be tedious and laborious to set out the levels by pegs in the way we have shown; the most expeditious and satisfactory course is to take the levels of the surface by an instrument for a considerable distance along the slope and beyond the limits intended for the house. We have described how the levelling is conducted on steep inclines. If the length of ground along the slope is considerable, or the steepness is such that each range of collimation is limited, the distance is divided into sections or steps, as A B, Fig. 36; the instrument is placed midway between the staves and the readings noted. Thus, as is shown in our diagram, the instrument can be placed on the area of the proposed house, and the sight extended to A as a back-sight, which will intercept the staff near the ground, and to B as a fore-sight, where the line of sight will intersect the staff high up—that is to say, the range of sight can be extended as high up and as low down the cliff as possible, thus saving a number of removals of the instrument. For example, in the diagram, the possible range of sight from one position of the instrument would be about 30ft. to 50ft., but with less inclinations longer ranges can be obtained sufficient for the purpose of obtaining a section of the ground. It would be necessary to drive a peg in close to the ground at A as a bench mark, also to measure the distance from A to B on the ground, reducing the same to horizontal measurement. An Abney level or clinometer is useful for this purpose, as by it the angle of slope can be accurately obtained and noted, the only requisite being that the clinometer should intersect at a point the same height vertically as the surveyor's eye, for which purpose a staff with sliding vane is necessary, the vane or cross piece being adjusted to the height of the eye before it is sent up or down the hill. We will explain the use of this instrument as we proceed. In the meantime it may be observed that the levels found in the manner described can be reduced from a datum taken so many feet below the bench mark, as before described, or if one line of collimation only has been used the levels can be set downwards from a horizontal line, which will represent a datum above ground level with the axes of telescope, as we have lately explained.

THE ARCHITECTURAL ASSOCIATION EXCURSION, 1889.—III.

[WITH ILLUSTRATIONS.]

RESUMING our descriptive account of this excursion, we rejoin the party on their Wednesday's outing, which extended into Lincolnshire, by train from King's Lynn to *Long Sutton*. We give herewith two drawings of the great church of St. Mary's in this place, one showing the lead-covered spire and tower, and

the other the beautiful south porch, with the parish library over it, formerly used possibly as a registry or a priest's room. The plan of the porch shows how the chamber is reached, and Mr. Bassett Smith, who restored the church, has lately built a new stair turret, in fairly good taste and in keeping with the building. Mr. A. Needham Wilson's drawings include some useful details of this porch, which furnishes a choice example of groining, with detached wall shafts, as the plan shows. The Early English tower is, in a way, rather foreign in outline; but the detail is as pure as it can be. The roof is entirely constructed of timber, and it has twisted partly. A drawing showing the framing was published a few years ago in the A. A. "Sketch Book." It serves as a landmark from sea, and it looks well from every point of view. The noble Norman nave of seven bays is surmounted by the original clerestory arcade, which, by the erection of a higher stage in the form of a pseudo-Norman (18th century) clerestory, is converted into a pseudo-triforium stage, with very happy effect, though, of course, no one could admire the work now added over it, which outside is finished in cement. The octagonal chamber which projects from the east wall of the chancel is in two floors, and has a high-pitched roof of stone, and small windows quaintly arranged. This addition increases the picturesqueness of the exterior considerably, and it is used now as a vestry. The upper chamber is roughly vaulted in rubble. The nave roof is of queen-post character, with spandrels filled in with pierced tracery. The chancel has a rich, simple old roof, with angels sculptured on the wall-posts. There is an old stone altar in the south aisle, properly mounted in oak, and carried by a Jacobean oak table. Near here is some good old glass, specially a full-length 14th-century costume figure of St. George and the Dragon. The font has a carved 18th-century balustrade inclosure, in wood. The new reredos is coloured, and the place is well kept; but the new pulpit, erected without the architect, is monstrously ugly, and likewise very pretentious.

St. Mary's, Gedney, next seen, is represented on our double-page plate to-day, and a sketch plan of the building is also given. The porch is a good one, and had a parvise; the tower is a fine design, and once had a spire, they say, 100ft. high; but the chief feature now in this church is the exceedingly light clerestory of refined Perpendicular style. The old roof over the nave is rather lumpy in effect, because the arched timbers of the principals run off above the spandrels into mere rafters, and judged from their bulk, do not look at this point more important than rafters, though they are moulded, and have good bosses on them. One truss only has a hammerbeam to it, and the whole piece of construction is very odd. Along the string below the clerestory are some grand 14th-century stone carvings, very bold and telling. One fellow near the west end on the south side is particularly handsome, and is worth study. There is some old glass of beautiful colour in this church in the north aisle. The east window represents "Solomon in all his Glory." The church is bepewed, and has a handsome Georgian pulpit with a great overspreading sounding-board. The Gothic screen and reredos are expensive works in poor taste, done fifty years ago. The hideous stove-pipes in the church ought to be cleared out, and so should the crumbling Classic-like west gallery. The massive oak carved door to the porch has a wicket in it and an inscription. The very early bronze lock and furniture to this portal are very interesting, with grotesques on the handle. The lead stack-pipes, dated 1674, remind us of some other choice 17th-century examples of the plumber's art. The Wilby of Gedney marble tomb on the south wall of the aisle is a refined example of its kind, dated 1606.

Holbeach Church is well known. It has a vast tower and spire at the west end. These are our notes: In the north aisle is a deeply-recessed, richly-canopied, and diapered altar tomb to Sir Humphrey Littleborough, who fought in the Wars of the Roses. Along the top is a course of roses beautifully carved, and surmounting the whole is the effigy of the knight in full armour, with his head resting on a mantling, and a woman's head inclosed in a net for a pillow, which is curious, and affords much scope for speculation. This large church has a lofty Perpendicular nave with a regularly-spaced clerestory over the seven bays of the arcade. There is a new hammer-beam roof by Mr. Ewan Christian, who restored the church twenty years ago. He designed the pulpit and the altar-rail and screen forming the vestry. The new benches in the nave are very simple and good. The recently-erected organ by Mr. R. J. Withers, of the Adelphi, with panels in colour, though more in scale with the detail of the church than Mr. Christian's screens, we cannot like, particularly the front with its bay and ugly wing cresting over it. It is not a bit like an organ-case. The groined north porch, with the quaint circular turrets to it, is very quaint, and looks well in the grouping from the street; but it sadly needs repair.

Whaplode is an outlying small village, but its church is a large building, and has some fine bells in the tower, placed on the south side of the choir. Outside, the church forms an imposing group, but the windows throughout are very poor. The Norman nave is Early and not very good, but it was extended westward in Transitional times, and the arcade at that end is admirable. The old 14th-century roof is in a bad state, and is roughly shored up. The chancel arch is Early Norman, and the west door is a good Early English one of large size. The chief object in the church is the big effigy tomb, standing within an inclosure of ten stone columns, which support a great solid tester, the whole structure being protected by an iron railing. The interspaces of the tomb colonnade are enriched by kneeling figures. Three boys on the father's side and a girl on the mother's, with a baby in another compartment, the third bay on this side being vacant. It was erected to Sir Anthonie Irby and his wife, and is of Debased character, with Corinthian caps to the columns; but the figures, in Charles I. costume, are very well done. The ironwork is simple and effective.

Moulton, another Lincolnshire church of considerable dimensions, and justly celebrated for its western tower and spire, which is crocketed from base to finial, with flying buttresses at the four angles of the tower. A view of it is given in Sharpe's account of the first excursion held under his direction in connection with the Architectural Association. It is of Perpendicular character, and is vaulted inside to the height of the body of the church. Over the nave, which is of Early date, is a simple tie-beam roof, carried upon the Transitional clerestory. The ancient rood-screen is mutilated. Mr. Bassett Smith restored the church carefully, and reseated the fabric very suitably; but an arrangement of return stalls in the chancel would have been an improvement upon the present seating.

Spalding Church has a western tower and spire, built somewhat similar to Moulton, but not so elegant and refined. The church is much larger, with transepts and double aisles. The restoration was admirably done by Sir Geo. Gilbert Scott, and the sanctuary is thoroughly well cared for. The new rood over the screen, which Scott restored, lacks the figure, but the colouring is pleasing. The detached chantry, east of the south transept, long used as a grammar-school, has been restored lately, and a cloister from the church erected. This will serve as an admirable morning chapel. We have seldom seen a church which looks more thoroughly in character with Catholic worship than that at Spalding.

Owing to the continued downpour of rain the visit to Crowland, with its abbey and triangular bridge, as well as to Thorney, had to be given up; and the excursionists returned by an earlier train than originally intended to King's Lynn.

Thursday's proceedings began by an early halt at

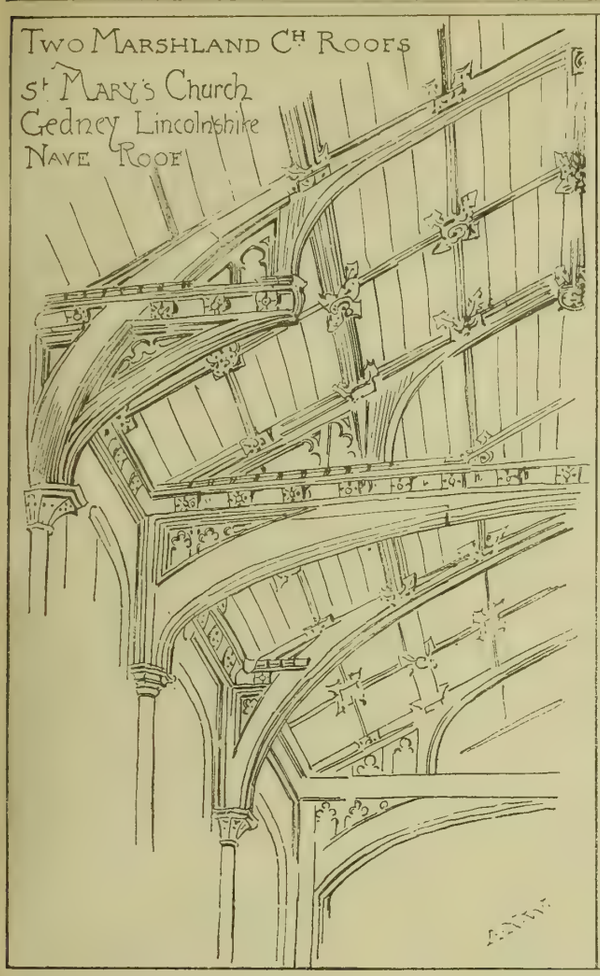
Hillington Hall, an hour's drive to the north-east of Lynn. The building is situated in a beautiful park, and has extensive gardens which are well kept up. The house is a complete specimen of the Mediæval style which preceded the early days of the Gothic revival, such as that with which Wyattville's and Batty Langley's names are usually associated. There is a sort of dignified pretentiousness about the design, with its lofty cortile or central hall which makes the house worth seeing, and its details, though sufficiently Debased in style, are carried out massively and in solid materials. Otherwise the mansion is not particularly interesting. Mr. John L. Robinson, A.R.H.A., of Dublin, here took one of his large photographic groups of the party. After seeing the stables, the visitors proceeded to

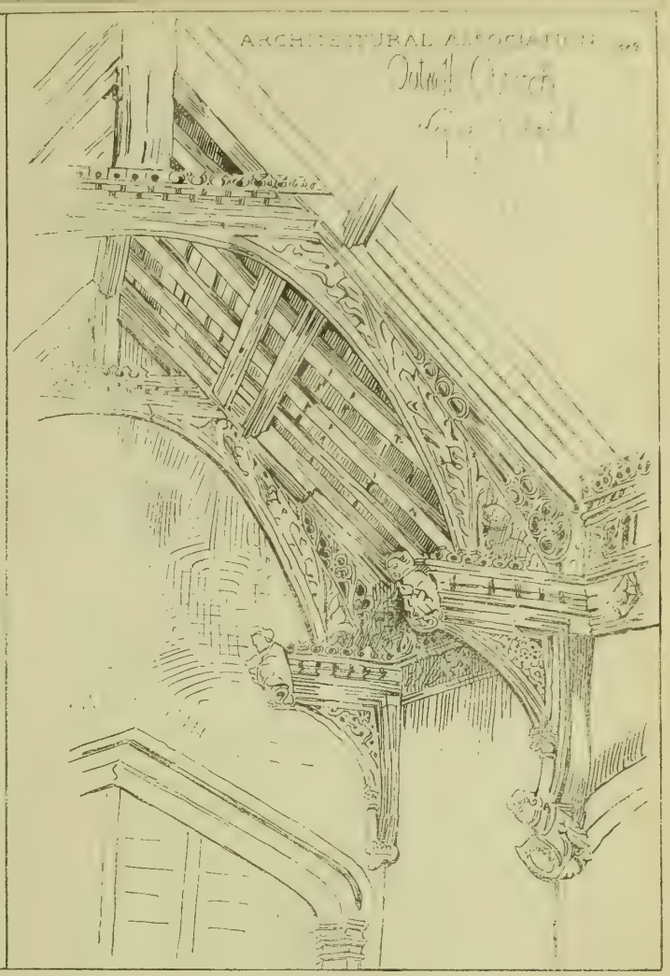
Harpley Church, a few miles further east. Here the good south porch and elaborate parapet over the clerestory at once attracted attention, and on entering the church the rich Decorated door to the main entrance found many admirers. The handsome doorway to the vestry likewise deserves mention. The roof of the nave is a further example of the variety of treatment adopted by the old Norfolk builders. The ribs of the principals are arched with a drop down at the apex on which pendant form a carved boss is attached, the place of the ridge being taken with a double moulded purlin on either side, thus forming a flat, long panel about 2ft. wide between them enriched by a series of angels placed lengthways with the nave. The deep wood cornice over the walls has a sort of dentil treatment, and spread angels grouped along with telling effect. The original Perpendicular seats in the nave are roomily spaced, and have openwork traceried backs in geometrical patterns, while there are good carvings to the elbows. The 14th-century screen has been restored and sent up to London to be redecorated with florid figures in flash colours and gold by a firm of church furnishers. They look better at a distance. The pulpit and choir-stalls are new, and the Church is well kept—a note which means much every way, and deserves to be mentioned. The roomy, unseated space at the west end of the church is of great importance, and where it can be managed should always be arranged. In the south aisle there is an uncommonly good Geometrical-period sedilia and piscina, with trefoil heads and delicate detail, having mouldings which look to be of Later character.

Houghton Hall, erected by the great Sir Robert Walpole between 1722 and 1738, was next seen. This vast stone-faced pile of buildings, designed by Colin Campbell, the compiler of "Vitruvius Britannicus," is regarded by some as the most magnificent mansion in Norfolk. Ripley, the protegé of Walpole, finished the house, as Pope's satire records:—

"Heaven visits with a taste the wealthy fool,
And needs no rod but Ripley with a rule."

Architecturally, the façades are heavy and coarse in scale, with a domed pavilion at either angle, and a colonnade fronting the wings, which branch off to the right and left in a semicircular form on plan towards the gardens at the rear. Externally, the house seems to want a base to lift it out of the ground, and on both sides the absence of a grand entrance is a great want. Originally there was a double staircase leading up to the central hall or cortile on the park side; but this has long been pulled down, and the single small portals entering into the vaulted hall on both fronts are the only entrances now, except that in the right angle facing the drive, and originally intended for servants' use. As a matter of fact, this is the doorway mostly used for all purposes. Inside, the house is rich in treasures of all kinds, particularly the beautiful tapestries and embroideries in the chief bedrooms, where the old contemporary bedsteads are described as being among the best of their kind. We have never seen better; those at Hampton Court cannot be compared to them. Their needlework hangings are quite a complete study, and some are of admirable design. The central hall, with its gallery over on three sides, and florid plaster cove and ceiling above, is richly furnished, and most of the rooms have some notable pictures by the great masters, and there is a quantity of excellent furniture, chiefly Old English. On the landing of the principal staircase, which is a handsome one, are some rare pieces of inlaid Italian furniture, of exquisite design, and in the centre of the staircase, well on a lofty pedestal, which we think too large, is a bronze cast of the Laocoön by Girardon. The marble dining-room is a beautiful apartment, with a grand marble chimneypiece, and behind the open arches on either hand are marble service buffets, with bronze taps for water. The service-door between these is hidden from the room by the chimney-breast, at the back of which is a lift or cupboard for wine intended for immediate use. Several hours were well spent in inspecting Houghton, Lord Cholmondeley's Norfolk home, which he inherited from the Walpoles, and now, we understand, wishes to sell. At present the place is in other occupation. The celebrated Houghton collection of pictures, one of the finest galleries in England, was sold, to the national loss, in 1779, by George third Earl of Oxford, nephew of Horace Walpole, to Catherine of Russia for £40,550, and is now at St. Petersburg. This madman refurnished the house with pictures





by that flimsy scene-painter Cipriani, and so replaced Guido, Claude, Vandyke, Rubens, &c. There are, however, still many interesting family portraits in the house, including one of Catherine of Russia who obtained the great collection. The stables are large and important. The visitors found little to sketch here, but the house is certainly one to be seen by all architects.

Great Bircham, to the north of Houghton, has a church of no great importance as churches rank in this rich district, but it well repays a visit. The ancient altar-cloth of 1450 date, is a refined example of work still in use, and has a group of two four-winged angels, elaborately embroidered in gold on purple velvet. The double-headed eagles below the angels we do not understand, but they form part of the original design. The nave arcade in this church is Early English in four bays, very lofty, and refined in detail though Late in style. The caps are moulded, and the fillet runs up all the shafts. The altar is Jacobean, and the remnant of the rood-screen is Perpendicular in character. There are good square-headed 14th century windows in the north aisle, and a plain massive tower is placed N.W. of the nave. In the north aisle is an admirable little doorway which several members sketched or measured up during the visit.

About 15 miles from King's Lynn lies *Snettisham*, on the top of a hill, in a beautifully wooded undulating country. We published a view of the church in last week's Building News by Mr. E. Guy Dawber, and in Vol. VI. of the A.A. "Sketch-Book" (new series) will be found a drawing of it by Mr. A. B. Mitchell. The central tower and spire of this building are notable features, and as a mark for sailors at sea are well known. The west front is quite cathedral-like in idea, owing to the portal of three arches, with one little low room over it, now used for lumber. The west window is very handsome and large, with a decided Flamboyant character about it; but it is a trifle too crowded in the tracery. The lofty Decorated nave has a dwarf clerestory, with circular lights interspaced with squatly-proportioned windows late in the same style. The arched principals of the roof mitre with the moulded purlins. The lead rests directly on the rafters, and shows on the soffit between. The aisle windows are large and rich, forming quite a feature in the composition. The nave seats are new, from the designs of Mr. William Butterfield, who restored the church, and they are executed in elm and oak. The pulpit is principally new, and has painted panels containing rather stupid figures, crude in colour. The new screens here and there in the church show Mr. Butterfield's taste, which some may question. The north aisle door, with the arch mouldings dying into the curved splays of the jambs, is a good example of pure Gothic work worthy of imitation.

Dersingham Church, next seen, has a Decorated nave of six bays, having trefoil-headed piers and labels with carved terminals. The old rood screen has figure-painted panels below; the old benches are reused in the nave, and in the choir they are new. Mr. Ewan Christian did the restoration here, using teak for some of the fittings, and cedar for the repair of the font cover. The aumbry at the back of the altar is curious, and is made too much of at present. The church is well kept, and the restoration is well done. The ugly effect of the four monumental mason's angels at the angles of the great west tower is to be regretted as a mistake, and spoils the external grandeur of the upper stage.

Sandringham Park was now entered, and Mr. Beck, the agent of H.R.H. the Prince of Wales, received the party, and took the members over the Royal residence, showing also the new ball-room, erected a few years ago from Col. Edis's designs. The dairy and farm were inspected, as well as the gardens, the stables, and church.

Castle Rising was next visited, with its castle, church, and almshouses, a view of which latter group of buildings appeared in last week's Building News. The church was restored by Sir Arthur Blomfield, A.R.A. Its west front and saddle-back tower are its chief features, and these, like the history of the great keep in the ballium, reached by a stone bridge over the fosse of the castle, need not detain us here, as they are well known, and frequently have been described. Thus ended the busy and varied work of Thursday's programme.

Friday's outings began with West Lynn; but it was thought wise to leave this church out and so devote more time to Terrington St. Clement's, one of the grandest churches to be seen in this district, and is well called the "Cathedral of the Fens." We published a complete set of measured drawings of the building in our pages for July 25, 1884, and the font, with its grand pinnacled cover, drawn also by Mr. J. R. Sutton, appeared in the Building News for December 26, 1884. These were from the set of prize drawings of the R.I.B.A. The church looks better at a distance, as the detail is a trifle coarse. The clerestory is exceptionally handsome, and outside the wide splays give great richness of effect. The great western detached tower, situated on the north of the church, is very broad and noble in design. The central lantern or tower has gone, if it ever was built, which we question. The springers to the groining inside below still remain. Want of space prevents our giving a transcript of our copious notes on this church, which is now in the hands of Mr. Thompson, of Peterborough, under the direction of Sir Arthur Blomfield, A.R.A., who would do well to remove the burial-place under the chancel and restore the level of the old sanctuary.

Walpole St. Andrew has a brick façade western tower with a hermitage cell built on to its west front, having a two-light window inserted in the adjoining buttress. This figures in Brandon's great book, and is interesting. The nave arcade reminds us of Long Melford and Saffron Walden. The windows to the aisles are curious, with heavy transomes quaintly worked in. The Jacobean enrichments added to the earlier seats in the church attracted attention from those who are apt to note items of detail. We gave a sketch of the old hour-glass stand in this church last week.

Walpole St. Peter's, next seen, was the most interesting church visited during the week. We give a large sketch of the south porch and a plan of the church herewith to-day. The interior is filled with Jacobean pews raised above the floor, and the font cover, with opening doors hung like a tryptic, is highly elaborated with open-trusses, fluted shafts, perspectived arched panels to the

main body, which has a rich cornice with cresting of Elizabethan character, and open fretwork panels to the roof, with finials ranging round a ball terminal at the top. The old three-decker pulpit is later in date, and later still is the pedimented headed screen which extends across the west end of the nave, inclosing the pewing. We hope that neither this nor the benches will be removed. The 14th-century seats are placed college chapel wise in the aisles, and although the 17th-century architect added some ornament of his own to these benches, he did not spoil or demolish them when he filled the body of the nave with his pewing, which we trust will be left as it is untouched. The stone font is very like the rich one at Walsoken, illustrated by us to-day, but it has no sculptured panels. The wall arcading in the choir has cusped recessed panels canopied for stalls, and above these between the windows are rich niches with pinnacle work canopies inclosed by an ogee arch growing out of the wall shafts, which carry the corbels supporting the wall posts of the roof principals. The original tie-beam roof over the nave remains. The nave arcade of seven bays is very bold and well proportioned, with arch mouldings indicative of earlier work than the pier-caps and vases seem to suggest; but the fillet on the shafts is coarse, and grows properly out of the base, otherwise it might be thought that the caps had been re-worked. The aisle windows are exceedingly large and handsome, with sills very low down all round the church. The choir windows are said to have been filled with stained glass, but this was demolished in the early days of the present century. The great feature of the chancel is the high elevation of the sacrarium, with the altar towering well above the nave. The public passage-way under the altar accounts for this, and the plan we give shows how it is contrived. This preserved an ancient path, and in no way corresponds with the crypt at Hythe, Kent, about which a correspondence has taken place in our pages. The sanctuary is rich with flowers placed on the steps, and the church is thoroughly well cared for. Note the grand brass chandelier in the centre of the nave and the old Jacobean alms-box at the west end. We give a better one, however, to-day from Outwell Church, a plan of which church appeared in last week's issue of our paper. The splendidly-designed turrets over the chancel gable group well with the ancient sanctus bell turret at Walpole St. Peter's, which contains the bell restored to use by the present parish priest. There are charming little lights to the staircase turrets, inside and out. The west tower is well designed with good belfry windows. The lower part of the Perpendicular rood screens to the Lady-chapel, as well as choir, remain, and also the return stalls, which are still in use. The carved beam corbel in the N. aisle where the old roof is *in situ*, shows how the Lady-chapel was cut off, and the piscina, &c., to this chapel still remain. Outside it can be seen where the mural brass of our Lady once existed on the east buttress.

We have no room left here to describe *Tilney All Saints*, the tower of which we illustrated last week. With this church concluded the visits on Friday. Mr. W. M. Fawcett conducted the members over Ely Cathedral on Saturday, and having two drawings of this building to give from the pencil of Mr. John Johnson, we may reserve any further remarks till then. The view of the Custom House, King's Lynn, published herewith to-day, is from a very fine photograph by Mr. Payne Jennings, of Ashtead, Surrey, who has a capital series of round-tower churches and other buildings in Norfolk. The view of the old brick porch, with terracotta work, at Thetford, is a good reproduction of an original drawing by John S. Cotman, dated 1818, lent us by Mr. J. R. Bulwer, Q.C., from the Burlington Fine Arts Club exhibition of that master's works. The style of the building is like that at Great Barsham Hall, Norfolk; Oxburgh, seen on Tuesday; and Layer Marney, Essex. The drawing given also of the screen at Wiggenhall, by Mr. E. Guy Dawber, is a useful detail. The sketches of the nave roof, St. Mary's, Gedney, and that of the Lyme Chapel, Outwell, are interesting studies well worth giving here. The excursion, in spite of the rain and dull weather, was a decided success, and was most enjoyable. The final dinner took place at King's Lynn on Friday. Mr. Wellard acted again as quartermaster, and thus did much to secure the comfort of the excursionists.

MASONRY AND STONE-CUTTING.*

By Lawrence Harvey.

[TWENTY-FOURTH LESSON.]

GROINING IN ANNULAR VAULT, OR INTERSECTION OF ANNULAR VAULT BY CIRCLE ON CIRCLE ARCH.

THE principal vault of this structure is annular—that is, a vault supported by two concentric ring-walls, described on plan (Fig. 147)†, with radii ω D, ω A, ωd; a vertical erected over the centre ω is the *axis* of the annular vault; the intrados or soffit of this vault is a *torus* or *annular surface*, engendered by the revolution of a vertical half-circle A′ F′ E′ B′ (Fig. 148) round the axis ω. The Fig. 148 is a *Meridian Section* of the annular vault.

Now, begin by drawing the jointing of the vault on the meridian section as that of any ordinary arch. In this diagram I only use five arch-stones for clearness' sake; but, of course, many more are to be used, according to the span of the vault, as in Fig. 146. It is evident that in the revolution of the meridian section round the axis of the structure, the points F′, E′, . . . describe horizontal circles F M . . ., E N . . ., which are the arrises of the bed-joints of the annular vault; in the same time the joint-lines F′ G′, E′ H′. . . ., which prolonged would cut the vertical axis ω, describe conical zones; these are the bed-joints of the annular vault. To complete the jointing of the annular vault, divide each course of stones by cross-joints, breaking joint; these cross-joints are meridian planes.

This annular vault is intersected by arches, each of which is comprised between two vertical planes, C c and D d (Fig. 147), which converge to the axis of the structure; the arches spring from the same level, and rise to the same height at the crown as the annular vault. The soffit of these arches is a conoid engendered by *a horizontal line moving up and down in contact with the vertical axis ω and the outline of the face-arch from* C *to* D, the delineation of which is given below.

Rectify arc C O D along the tangent C″ O″ D″; then describe an ellipse, the major axis of which is C″ D″, and the minor axis O″ Z″, equal to the radius O′ Z′ (Fig. 148) of the annular vault. Cut this ellipse out of a flexible sheet of zinc, and roll it on the surface of the wall; its outline will then form the *opening of the face-arch*, which is the *base* or *directing curve* of the conoid.

In drawing this ellipse in Fig. 149 I have used the method of the circles described on the axes, because I find thereby directly the points e'', f'' . . . which are at the same level as E′, F′ . . . This method also facilitates finding the tangents in these points.

The intersection of the conoid and the annular surface is found by cutting them by a series of horizontal planes. The plane at the level of F′ (Fig. 148) will cut the torus along two circles projected on plan in F M and F_2 L; it will cut the conoid along two straight lines $f\omega$ and $f_2\omega$. The points M and M_2, L and L_2 where these four lines meet are on the intersection of the conoid and torus.

To find the generator $f\omega$, take on the ellipse (Fig. 149) the point f'' at the same level as F′ (Fig. 148), then take the arc O″ f (Fig. 147) equal to O″ f'' (Fig. 149). To measure these lengths on the circumference of the outer wall, the easiest way is to cut the circle out of thick carboard, pin it down on the plan, then take the lengths on a flexible strip of paper and roll them on the edge of cardboard circle. The point f found, join it with ω, and $f\omega$ is the generator required.

The intersections of the conoid and torus are on plan the curves A M N O K_2 L_2 B_2 and B L K O N_2 M_2 A_2; these curves are Archimedean spirals. The intersections themselves are curves of double curvature, and they form groins separating the annular vault from the circle on circle arch.

Normal Joints (Figs. 147-50).—In the annular vault the surfaces of the bed-joints form conical zones; but in the circle on circle arch the surfaces of the bed-joints are the locus of the normals to the soffit of the arch along a joint line, such as f M ω; as we have seen in former skew-surfaces, the normals are found by the help of a connecting paraboloid in which a tangent is used instead of the directing curve.

For this operation select a projection plane (Fig. 150) perpendicular to the generator f M ω, and on which this generator is projected on one single point M′ placed at a height U′ M′ = $f f''$ = F F″; then, after finding (Fig. 149) the tangent f'' T″, carry the subtangent f T″ on f T (Fig. 147) tangent to the base of the base of the outside wall; f T, M′ T′ are the plan and elevation of the tangent to the directing curve of the conoid. Now, if on the tangent (f T, M′ T′) and on the vertical axis ω an horizontal line is made to slide, it will engender a paraboloid which will have common tangent planes with the conoid all along the generator (f M ω, M′); and the line T ω drawn at the level of the plan is a generator of that paraboloid. Cutting the paraboloid with planes M P, L Q . . . perpendicular to f M ω and therefore parallel to the directing lines, we know that the sections will be straight lines; it follows that, projecting P, Q, . . . on Fig. 150 in P′, Q′, . . . the planes M′ T′ T, M′ P′ P, M′ Q′ Q, . . . are tangent to the paraboloid, and therefore also to the conoid, in the points f, M, L, . . .

The normals to the conoid are the lines (M′ R′, f R), (M′ S′, M S), (M′ V′, L V), . . . of which a series taken close together form the surface of the joint; this is also an hyperbolic paraboloid, and one which coincides exactly with the connecting paraboloid when the last is turned round one quarter of a circle round the horizontal generator (ω M f, M′.) The upper horizontal plane of the stone cuts the joint of the circle on circle arch at the same level as that of the annular vault; take, therefore, on Fig. 150 the vertical U′ G″ = G G′ of Fig. 148, then draw the horizontal plane G″ R′ which will cut the normals in the points (R′ R), (S′ S), (V′ V), . . . through which draw the curve R S V, . . . intersection of the bed-joint of the circle on circle arch by the upper horizontal plane of the stone. This curve is an equilateral hyperbola of which the asymptotes or limits are the line ω M f and a line at right angles with it through ω; the apex of this hyperbola will, therefore, be found by a mean proportional to the two co-ordinates of any point of the curve as drawn in our diagram.

The hyperbola R S V meeting in the point X the circle G X, upper edge of the conical bed-joint of the annular vault, the point X is a point of the intersection M x X of the two bed-joints. To find another point of that intersection cut the surfaces by an horizontal plane at the level of g' (Fig. 148) mid point of F′ G′; this plane will cut the conical joint along the circle g x and the parabolic joint along an hyperbola r x similar to the one already drawn. The point x will be the point required.

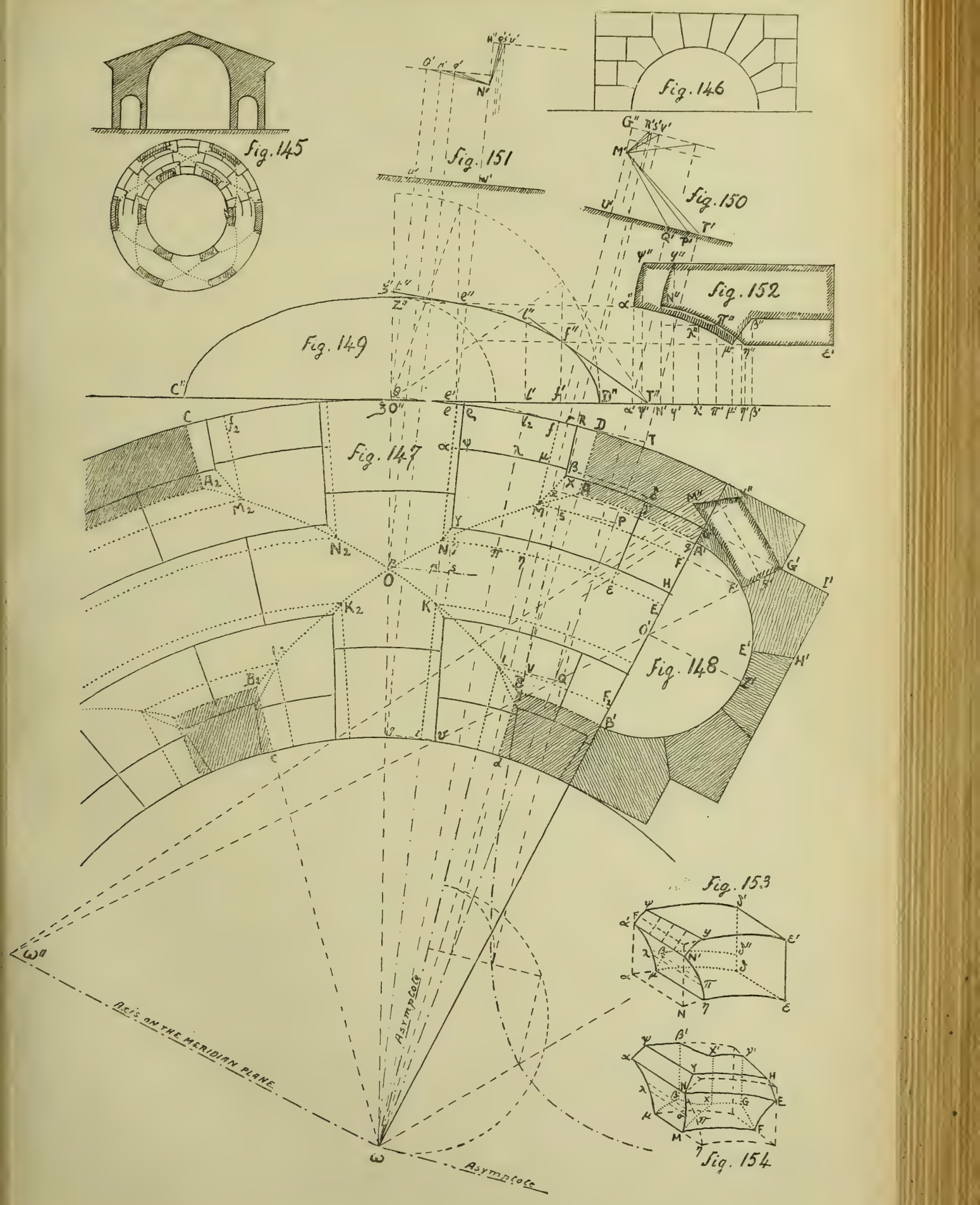
For the upper joint of the arch-stone E′ F′ G′ I′ H′ (Fig. 148) the same operations are required as for the lower joint. The elevation plane for the circle on circle arch bed-joint is taken (Fig. 151) perpendicular to the line ω N e. In finding the tangent, as the horizontal trace would be too far, we use instead the point θ where the tangent cuts the vertical plane ω O″. The point θ does not coincide with the point t' in fig. 149, but it is further up the line in z''. Place, therefore, the point θ' (Fig. 151) at a height u' θ' = ζ ζ'' (Fig. 149), and the line (e θ, N′ θ') is the tangent to the curve of the face arch. With this exception the operations are the same as for the lower joint. The upper edge of the bed-joint will be an hyperbola g s v, of which the asymptote is the line ω N e. This hyperbola meets the circle H Y in the point of Y, which belongs to the intersection N Y of the parabolic bed-joint with the conic bed-joint.

Moulds (Fig. 147, 152).—Let the arch-stone be limited on the annular vault by the meridian plane γ ε, and on the circle on circle arch by the vertical cylindrical surface α β; the plan of the stone will then be contained within the outline α β χ γ ε N α. To work the stone begin by prolonging the cylindrical surface α β to the point δ on the meridian plane, and produce a prism of base σ δ ε N, and of height equal to the difference of level of F″ and H′ (Fig. 148).

On this prism we must delineate the intersections of the cylindrical sides α δ and N ε with the soffit and the bed-joints of the circle on circle arch. To do this, develop these cylindrical surfaces (Fig. 152), taking the distances, α' ψ', α' λ', α' μ', α' b', α' δ', equal to the arcs of same denomination in Fig. 147; then carry above these points their heights, the levels of which are found in Figs. 148, 149. For the intermediary point λ, a generator λ π ω has been prolonged to the point l_2, where it meets the outer face of the wall; then, developing arc O l_2 in O″ l', get the point l' l'' on

* All rights reserved.

† (Notice, the plan drawn in Fig. 147 is supposed seen from above the vault; the joint lines on the extrados are therefore full, and those on the soffit are dotted.)


Fig. 145
Fig. 146
Fig. 151
Fig. 150
Fig. 152
Fig. 149
Fig. 147
Fig. 148
Fig. 153
Fig. 154
Axis on the Meridian Plane
Asymptote
Asymptote

the ellipse, from which deduce level of λ''. The intersections of the soffit of the circle on circle arch by concentric cylinders are ellipses when developed, and, therefore, the curves $\alpha''\lambda''\mu$, $N''\pi''\eta''$ (Fig. 152) are portions of ellipses, the major axis of which = the rectified arc of the sections, and the minor axis = the height of the vault at the crown. To delineate the curve $\alpha''\psi''$ intersection of the cylindrical face by the upper bed-joint, take the height $\psi'\psi'' = H H'$ (Fig. 148), and to delineate the curve $\mu''\beta''$ of the lower bed take $\beta'\beta'' = G G'$. For intermediary points, their levels are taken on Fig. 148, and the developments of the distances on the circles of the plan as shown before. In the second mould $y''N''\pi''\eta''\varepsilon''$ the intersection of the surface by that of the lower bed-joint is not delineated, because this bed-joint must not be prolonged beyond its intersection with the annular bed, where it forms a valley, and not an arris. The development of the lower conical joint of the annular vault is also required; delineate it as in Fig. 148, $G'X''M''F'$. The axis on the plane of the meridian section is at right angles with the ground line, and W'' is the centre of arcs $G'X''$, $F''M''$.

Working the Stone.—(Fig. 153). After having worked the operation prism of base $\alpha\delta\varepsilon N$ (Fig. 147) and of height = to difference of levels of points F' and H' (Fig. 148) as shown in Fig. 153, place on the convex and concave faces of the prism the moulds of Fig. 152, then delineate the outlines $yN'\pi\eta\varepsilon'$ and $\psi\alpha'\lambda\mu\beta\delta''\delta'$, and also the straight lines $\alpha' N'$, $\mu\eta$ and the hyperbola ψy taken from Fig. 147. Then, cut away all the stone shown by dotted lines, the soffit of the circle on circle arch to be worked with a straight-edge $\lambda\pi$, the upper bed-point with the help of a straight-edge sliding along the line $\alpha' N'$ and the hyperbola ψy and held at right angles with the line $\alpha' N'$. Then the stone will have the shape shown by the dotted lines in Fig. 154.

Now (Fig. 154) on the generators $\lambda\pi$, $\mu\eta$, . . . of the soffit of the circle on circle arch carry the lengths $\lambda\sigma$, μM, . . . taken from Fig. 147, and delineate the curve $N\sigma M$ which will form the groin of the stone; draw similarly the curve N Y on the upper bed-joint $\alpha N y\psi$; then, on the lateral face of the prism delineate the outline E F G γ' H from the section E' F' G' I' H' (Fig. 148); and, lastly, delineate the arcs of circle N E, Y H, M F, either with a flexible straight-edge or with templets cut to the curves on plan (Fig. 147). The soffit of the annular vault is then cut with the help of the meridian section sliding on the lines N E and M F; the templet must be held in its proper position by means of guiding marks obtained from the plan. The upper conical joint of the annular vault is cut with the help of a straight-edge sliding on the arcs Y H, N E. Then, mark on the upper plane the outline $\beta'\chi'\gamma'$ taken from the plan, and cut therefrom the two vertical cylindrical sides $\beta'\beta\chi\chi'$, $\gamma' G\chi\chi'$, mark on these sides with a trammel the arc of a circle $G\chi$ and the arc of hyperbola $B\chi$, then work the lower conical joint of the annular vault progressively until the mould $F' G'\chi'' M''$ (Fig. 148) can be neatly placed on it, thus the curve χM intersection of the bed-joints will be obtained. Lastly, the lower joint of the circle on circle arch is worked with the help of a straight-edge sliding on μM and $\beta\chi$ and held at right-angles with μM.

The central space may be covered by a cupola, as shown in fig. 145, forming a circular building, or by a semi-dome, as in a circular choir with surrounding aisles. The face-arches on the inner ring wall are often designed to be circular, in which case, begin by applying the semicircular templet of the face-arch on the inside wall, and deduce therefrom the outer face-arch. The same also can be done with pointed arches, although the usual constructions are done on an entirely different principle.

(*To be continued.*)

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—L.

By Henry Lovegrove, F.S.I., Surveyor.

A VILLAGE ELEMENTARY SCHOOL.

We now proceed to treat an entirely different subject—a building suitable for erection in a large village, either by the local school board or by a committee, with the vicar at its head anxious to dispense with a board.

It might be urged that, land being cheap in the country, schools are generally of one story; but for the present purpose, to produce a workable plan and effective elevations, the two-story system has been adopted.

The ground floor comprises the boys' department—a schoolroom, 50ft. 6in. by 22ft.; three classrooms, one 20ft. 6in. by 19ft., and two 20ft. 6in. by 15ft. The entrance to these rooms is on the left-hand side of the building; a cloak-room (with covered porch), and in connection w.c.'s, lavatory, and urinal.

On the right-hand side are similar offices for the girls and infants, the staircase to the upper floor starting from the cloak-room.

The first floor comprises a girls' school of the same size as the boys' below, and similar class-rooms, the space over the boys' offices being devoted to a Kindergarten room for infants, with a large cupboard for books and appliances at one end.

The space over the girls' offices is devoted to a teachers' room, with another cupboard for books and appliances.

The materials are described in the specification.

Specification of the works required to be executed in the erection and completion of School-buildings, in accordance with drawings prepared by Maurice B. Adams, F.R.I.B.A., architect.

PRELIMINARY.

1. *Notices.*—Give all requisite notices to the local authorities, and pay fees, if any.
2. *Water.*—Provide water for the use of the works.
3. *Drawings.*—All drawings and tracings prepared for the building and supplied to the contractor are to be kept clean, and returned to the architect at the completion of the works.
4. *Hoarding.*—Provide any necessary hoarding to protect the building materials and the public.
5. *Privies.*—Erect proper privies for the workmen, and keep the same in a clean condition.
6. *Roads.*—Make good to any roads or paths injured by the works.
7. *Grub.*—Grub up any roots of trees, old walls, or fences found upon the site.
8. *Sand.*—The contractor will be allowed to use the sand or gravel obtained from the necessary excavations; but digging for sand or gravel will not be allowed on the site of the buildings, and only in such parts of the playground as the architect may direct.
9. *Provisional Amounts.*—All provisional amounts are to be deducted in full, or in part, if not ordered to be expended, and the architect shall have full power to order payment direct to any person supplying goods included in such provisional amounts.

EXCAVATOR.

10. *Surface Digging.*—Remove the vegetable soil for at least 1ft. over the entire area of the building, and excavate for the trenches to the depths shown on the drawings. Fill in and ram round the foundations, and cart away superfluous earth.
11. *Concrete.*—Fill in for 12in. below the concrete under floors with broken bricks or hard core. Cover the entire area of building with 6in. of cement concrete. The concrete for foundations to be formed with fresh hard ground stone lime and clean pit ballast, in the proportion of one of lime to six of ballast, no stone to be larger than will pass a ring 2½in. in diameter. The concrete foundations to be 4in. wider than the bottom course of footings on each side, and 18in. deep.
12. *Rubbish.*—Clear and cart away all rubbish, and leave the premises clean and complete at the completion of the works.

BRICKLAYER.

13. *Mortar.*—The mortar to be hand-made, and to be composed of well-burnt stone lime and clean sharp river or pit sand, well mixed in the proportion of one of lime to three of sand. Burnt clay ballast, screened brick rubbish, or screenings from old buildings will not be allowed to be used in the mortar.
14. *Cement.*—The cement to be the best Portland cement—from Messrs. Hilton, Anderson, and Co., or other approved manufacturer, mixed with clean, sharp, well washed sand in the proportions, by measure, of of one cement to two of sand.
15. *Bricks.*—The bricks to be approved hard, well burnt local bricks laid in old English bond, and carefully bonded with the stone-work.
16. *Cover up.*—Carefully cover up the walls during any stoppage of the works or inclement weather.
17. *Walls.*—The walls to be carried up in level courses, no portion to exceed by one scaffold's height any other part, and the portion left to be raked back, not toothed. All joints to be well flushed up, and no four courses shall rise more than 1in. in addition to the thickness of the bricks without mortar. Carry up the walls to the various heights and of the thicknesses shown upon the drawings, with the recesses, openings, and projections as shown. The main walls to have three courses of footings, each course projecting 2¼in. beyond face of wall or footing immediately above same.
18. *Facings.*—All internal faces where not described to be plastered to be worked fair, the joints struck for distemper.
19. *Damp Course.*—Put a damp-proof course of two courses of stout slates in cement, laid to break joint over the surface of all walls just below the level of wood block paving.
20. *Trimmer Arches.*—Turn half-brick trimmer arches in cement, with proper feather-edged springers to all the fireplaces on the upper floor, and level up same in lime concrete to receive the hearths.
21. *Hearths.*—The hearths throughout to be 18in. wide, and projecting 6in. on each side of chimney opening, and formed of red 4in. paving-tiles bedded and jointed in cement. Fenders to be 4½ by 4 double-chamfered York.
22. *Fireplaces.*—Build the chimney-breasts as shown on the drawings, form flues in the easiest manner, parget the flues with cow-dung mortar, and properly core same. All chimney backs to be rendered; all openings to have 2in. by ½in. wrought-iron chimney-bar, with arches in two half-brick rings over same.
23. *Air-Bricks.*—Provide No. 18 Bath stone perforated panels as air gratings, with short flues through walls, the sunk portion of the panel to be 12in. by 6in., to be fixed to ventilate the joists carrying the upper floor.
24. *Discharging Arches.*—Turn discharging arches in half-brick rings in cement over all openings, and form proper skewbacks.
25. *Chases.*—Leave all necessary chases in walls for pipes, &c.
26. *Bed.*—Bed all frames, and point in lime and hair mortar.
27. *Flushings.*—Rake out joints, and point all flushings in cement, securing same with lead wedges.
28. *Pavings.*—The cloak-rooms, lavatories, and all floors on ground floor, except the school and classrooms, to be paved with 6in. red paving-tiles, bedded and jointed in cement.

A conference of local authorities was held in the Shrewsbury Shire Hall on Saturday, to consider what steps should be taken to allay the public anxiety with respect to the stability of the Llanwyddn dam of the Vyrnwy Waterworks for Liverpool. Mr. A. Salway, chairman of the Shropshire County Council, presided, and moved a resolution asking that the Board of Trade should from time to time cause the dams of all the reservoirs in the counties of Salop and Montgomery connected with the Liverpool Waterworks to be inspected by an independent and thoroughly skilled engineer of the highest standing, who should be appointed by them. The Mayor of Shrewsbury seconded the motion, which, having been supported by the Mayors of Bridgnorth and Oswestry and the chairman of the Madeley Local Board, was adopted unanimously.

The new public baths being erected at Guildford for the town council are approaching completion, and will be opened at the end of September. They are situate close to the Castle grounds. The swimming bath is constructed of concrete paved with White's hygienic rock composition, and the interior lining is of white glazed bricks, coloured bricks being used for the borders; the baths holds 50,000 gallons of water. Slipper baths adjoin. Mr. E. L. Lunn, of Guildford, is the architect, Messrs. W. and T. Smith are the general contractors, and the engineering work is being carried out by Messrs. Bradford and Co., of Salford.

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ILLUSTRATIONS.

A VILLAGE ELEMENTARY SCHOOL -ARCHITECTURAL ASSOCIATION EXCURSION SKETCHES—LONDON JOINT STOCK BANK, PALL MALL—NO. V. HYDE PARK-PLACE.

OUR LITHOGRAPHIC ILLUSTRATIONS.

A VILLAGE ELEMENTARY SCHOOL.

See "Practical Architecture," on page 250.

ARCHITECTURAL ASSOCIATION EXCURSION SKETCHES.

For description, see page 245.

THE LONDON JOINT STOCK BANK (LIMITED), PALL MALL BRANCH.

The building forming the subject of our illustration is that of the above banking premises just erected from the designs of Mr. R. Creese Harrison, architect, 103, Cannon-street, E.C. This branch, of which Mr. William James Adams is the manager, has existed on the site since 1841; but owing to the business having greatly increased, it was found necessary to build new premises, for which purpose the old building was to a very large extent taken down. The front is faced with Portland stone. The ground floor comprises a large banking hall, with manager's room and waiting-rooms, all occupying an area of 96ft. 6in. long by 33ft. wide by 27ft. high, well lighted from the front, rear, and centre. The basement contains the strong rooms, plate rooms, clerks' and porters' rooms, and lavatories, &c. The paving in the bank is of marble mosaic, and the fittings and screens are of Cuban mahogany. The contractors were Messrs. E. Lawrance and Sons; the carving to the front was executed by Mr. A. Bradford; and the clerk of works was Mr. F. M. Dorward.

NO. V. HYDE PARK PLACE.

Messrs. Joseph and Smithem are the architects of this building, but no particulars have reached us in response to our usual invitation. The photograph from which our photo-tint is made is by Mr. J. F. Knights, photographer, of Brixton.

The Palestine Exploration Fund is about to publish, uniformly with the "Survey of Western Palestine," a series of architectural drawings by M. Lecomte, illustrating M. Clermont-Ganneau's archæological mission to Palestine more than ten years ago. The accompanying letterpress will be written by M. Clermont-Ganneau.

On Saturday the opening of the Hebburn New Town branch premises of the Jarrow and Hebburn Co-operative Society took place. The new buildings are situated at the corner of Tennant-street and Shamrock-street, Hebburn New Town. They have a frontage of 27ft., and measure 60ft. from back to front. Mr. Hanson, of South Shields and Jarrow, was the architect, and his plans have been carried out by Mr. Lumsden, contractor.

The members of the Worcester Archæological and Architectural Society visited Worcester Cathedral on Saturday afternoon. The Dean, Dr. Gott, received the party, and, after the cathedral had been inspected, showed and described the deanery, parts of which date from 1270. An address was also given by Canon Creighton.

NEW PREMISES, SHOREDITCH.

OUR illustration represents a block of buildings now being erected at the junction of Holywell-lane and High-street, Shoreditch, from the designs of Messrs. Drury and Lovejoy, of 35, Bucklersbury, E.C., the contractors being Messrs. Patman and Fotheringham, of 102, Theobald's-road, W.C. The premises, which are to be used as a general outfitter's, are arranged with a well-lighted and convenient basement, a commodious shop with staircase at the end leading to equally commodious showrooms on the first and second floors. The remainder of the premises will be used as store and workrooms. The buildings above the second-floor level are carried out in red brick, with light terracotta dressings; and, for the greater facility of exhibiting the stock, the two lower floors are to be arranged with as much window space as possible.

OFFICE BUILDING, BOSTON, MASS.

THE Worcester *Spy* says that Norcross Brothers have just signed a 625,000dol. contract to build a twelve-story building for F. L. Ames, at the corner of Washington and Court-streets, Boston. Messrs. Shepley, Rutan, and Coolidge, of Boston, Mass., are the architects. It will be not only the tallest business block in the city, but one of the most striking architectural features of the picturesque old town. No adjacent building is more than five or six stories high, and more than one-half of the altitude of the building (184ft.) will tower with unobstructed view above everything else in the neighbourhood. The Ames Block will have a frontage of 78ft. on Washington-street, and 93ft. on Court-street. The first three stories will be of Milford granite, and the remaining nine stories of grey Ohio sandstone. The basement, 10ft. high, will have square windows; but the first story, directly above, will be 25ft. high, and will be lighted on each side by three arched windows of generous dimensions. In the third story is a row of many arched windows of smaller size, and an elaborate cornice above completes the design of the granite section. In the fifth story above this there are large arched windows similar to those on the first floor. The windows of the topmost story are small arched windows, while those on all intervening stories are square. From foundation to roof the corner windows are set in continuous solid masonry that projects beyond the central portion of the structure and gives the effect of pilasters. Sculpture and mosaic will be used liberally on the exterior, and the interior finish will be worthy of marble and iron. The first floor is designed for banking-rooms, and there will be room for safe-deposit vaults in the basement.—*The American Architect.*

THE SOCIETY OF ARCHITECTS AT CARDIFF.

THE visit of the Society of Architects to Cardiff commences on Monday next with a conversazione and reception of the visitors by the Mayor of Cardiff, Mr. David Jones, at the Assembly Rooms, Town Hall, Cardiff, at 8 p.m.

On Tuesday there will be an excursion in brakes, leaving Westgate-street, rear of Town Hall, at 10 a.m., to Llandaff Cathedral, Castle Coch, and Caerphilly Castle. Luncheon will be provided at Caerphilly Castle, and a meeting of the Society will be held there afterwards at 3.30 p.m.

On Wednesday, at 10 a.m., visits will be paid to Cardiff Castle, the Docks, new ironworks in course of construction for the Dowlais Iron Company, and other places of interest in Cardiff. In the afternoon and evening visits will be paid to Penarth, and Windsor Gardens. Trains leave Cardiff for Penarth from G.W.R. station at 3.39, 4.28, 5.18 p.m., returning from Penarth at 7.20, 8.20, and 9.15 p.m.

On Thursday there will be an excursion in brakes, leaving Westgate-street, rear of Town Hall, at 9.30 a.m., to the West of Cardiff, visiting various points of interest on the route, including Llantwit Major, Llantrithyd-place, Cowbridge, &c. Luncheon at Llantwit Major, tea at Cowbridge.

On Friday a circular tour will be made by Great Western Railway to Chepstow, Tintern Abbey, Monmouth, and Raglan Castle, following the course of the Wye Valley, by train, leaving the Great Western Railway Station at Cardiff at 10.10 a.m. In the evening at 8 p.m. there will be a concert at the Exhibition of the South Wales Art Society and Sketching Club, at the Queen-street Public Hall. The exhibition of the South Wales Art Society and Sketching Club will be open at the Queen-street Public Hall during the visit of the Society.

The visit of this Society is exciting considerable interest in the growing metropolis of the West, and will doubtless result in a considerable accession to its ranks and growing popularity.

RIVETED STEEL TUBING.

TUBING made of riveted steel is now largely manufactured in Glasgow by Messrs. Mechan and Sons. The pipes are made from steel sheets ranging in thickness from ⅛in. downwards. These pipes are used for steam, gas, and water, and are made from 4in. to 48in. in diameter. One of the earliest orders was for a water conduit for Savanilla in South America; a recent order was for a mile of riveted pipes, 4ft. in diameter in 28ft. lengths, ¼in. plates, for the Brighton sewerage system for carrying the sewage out to sea. Other applications of this tubing have been made for large gasworks, waterworks in Mexico, Australia, the Cape, Italy, and Spain, and we understand Mr. Deacon, of Liverpool, who is the engineer for the great scheme for bringing water into that city from North Wales, has used it. Multiple punching machines are used for the rivet-holes in the plates, capable of forming as many as 72 holes at a single operation. The riveting is done by hydraulic machinery, and the pipes are generally caulked by a process at once expeditious and efficient. The jointing for the Brighton sewerage system is formed by a ring which is riveted on the end of each pipe, and in which there is a hollow. An indiarubber ring is sprung on, the two pipes are butted together, and the halves of a cast-iron clamp are brought together and screwed up tight by screw-bolts. Another plan is to bring the ends of the two pipes together, and to shrink a flat ring on the end of each, forming a "double socket," which is drawn over the joint. The socket part receives the packing in the usual manner. We do not quite understand by this description how the socket is formed, unless one of the flat rings is made to enter the other, and to form a socket between the ends of the pipes. Dr. Angus Smith's composition is used to protect the pipes. The use of steel-riveted tubing has many advantages over cast iron, both in regard to tensile strength and elasticity, in many conditions for which it is employed.

CHIPS.

St. Michael's Schools, Lyme Regis, are warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester.

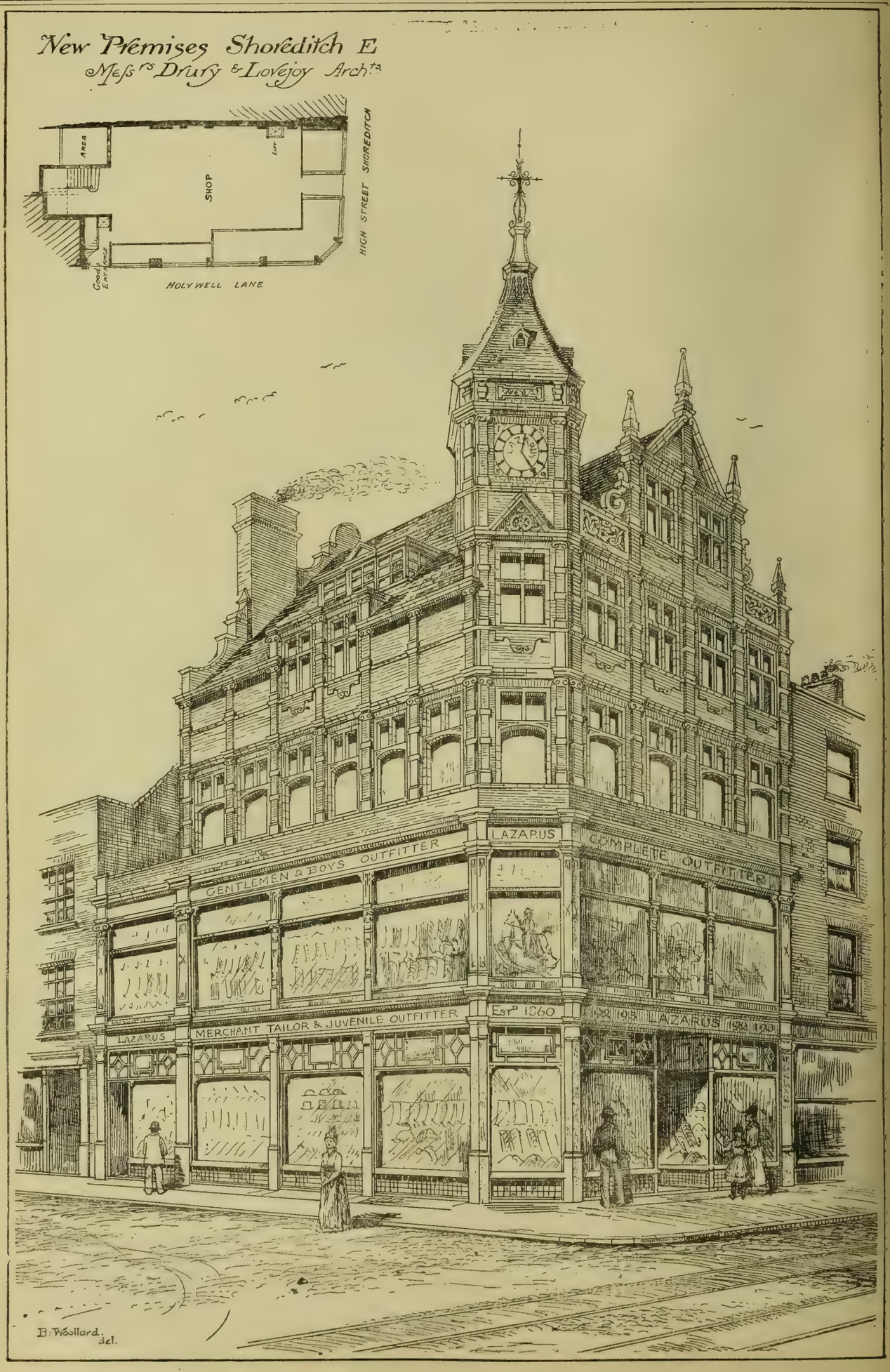
The vicar of Croyland appeals for further aid in rendering secure the Benedictine monastery church. The work has been in progress for a year, in accordance with a report by Mr. J. L. Pearson, R.A., Mr. John Thompson, of Peterborough, being the contractor. Of the ten sections into which the work has been divided, five have been finished, £31 8s. 7d. is in hand towards the sixth section, and £3,000 is still required to complete the entire scheme.

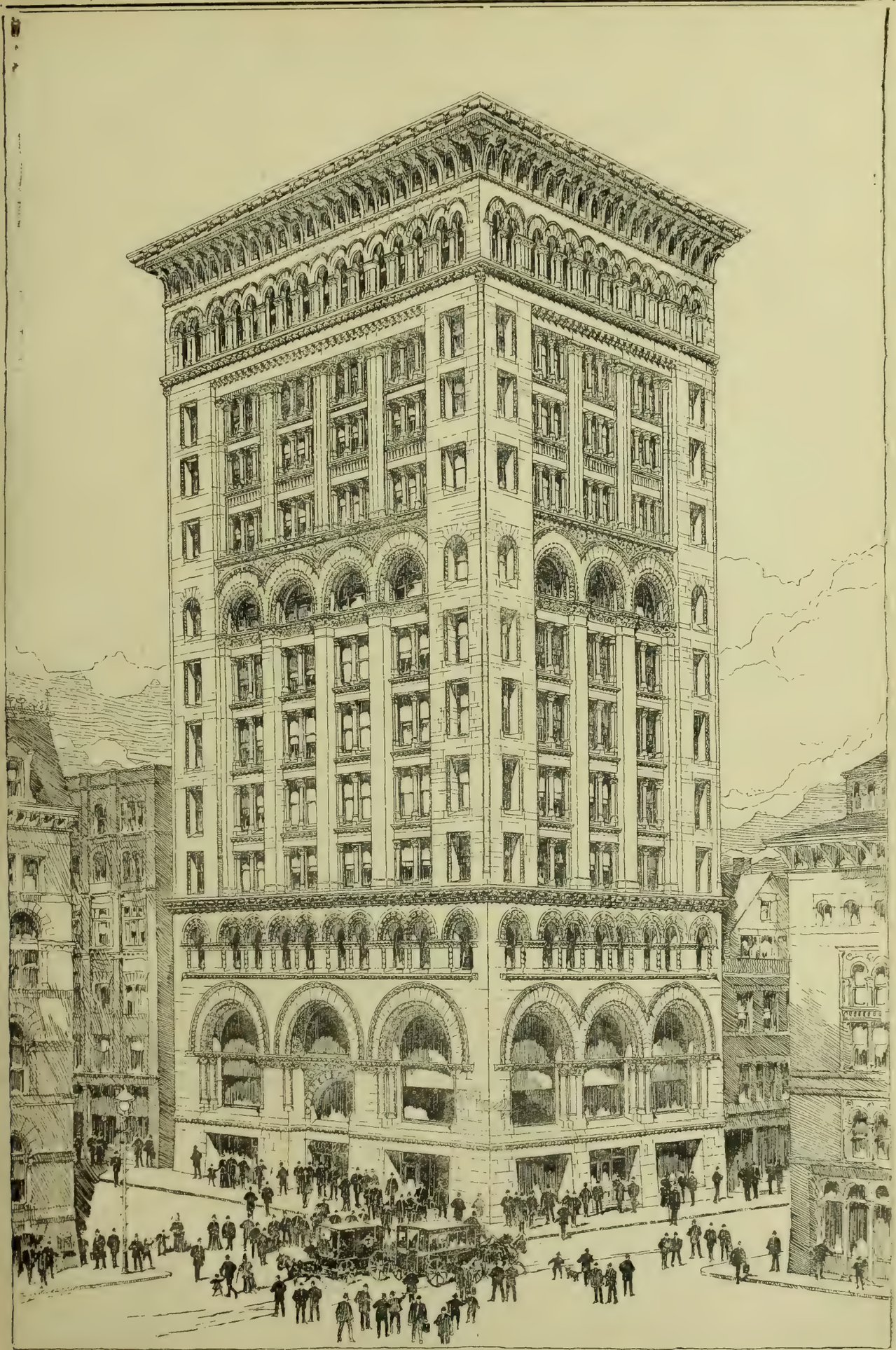
A large, temporary hospital for infectious diseases has been erected at Birmingham, and special attention has been paid to the ventilation, the extraction of the vitiated air being effected by Messrs. Robert Boyle and Son's latest improved patent self-acting air-pump ventilators.

The Board of Trade have just issued a series of regulations under the provisions of the Electric Lighting Act, 1888, for the protection of the public safety in certain cases in which overhead wires have been used for the supply of electricity.

The Islington Vestry have decided to adopt the Public Baths and Washhouses Acts. It is intended to borrow £50,000, in order to erect three separate bathing and washing establishments in the parish.

On Monday week a new infants' school, erected for the School Board for Bentley, near Doncaster, was opened. The building contains one schoolroom and one classroom. The rooms are paved with wood-blocks so as to deaden sound, and they have high dado boarding of varnished pitch-pine. The building is of brick, with stone dressings. The old school has been enlarged at the same time, and new cloak-rooms and offices provided. Mr. C. J. Innocent, of Sheffield, is the architect, and Mr. W. Johnson, Doncaster, the contractor for the whole of the work. The cost has been £1,165.


New Premises Shoreditch E
Messrs Drury & Lovejoy Archts
AREA
SHOP
LIFT
HIGH STREET SHOREDITCH
GOODS ENTRANCE
HOLYWELL LANE
LAZARUS
COMPLETE OUTFITTER
GENTLEMEN & BOYS OUTFITTER
Estd 1860
LAZARUS
MERCHANT TAILOR & JUVENILE OUTFITTER
LAZARUS
B. Woollard del.



OFFICE BUILDING, BOSTON, MASS.

WAYSIDE NOTES.

THE regeneration of architecture as a progressive art has been the subject of much thought and opinion. Few topics have been so frequently thrashed as that touching the state of architecture and its possible future. The causes that have led to its present position have been variously stated, and *nostrums* that shall insure progress have been plentifully put forward. One of these latter is a return to the building of monasteries. I have listened to a discourse bewailing the decay of monastic orders or brotherhoods in this country. According to some architects, all true art disappeared with this decadence. It has even been asserted that only with the revival of this system of religious orders and church communities will Ecclesiastical Gothic architecture be made once more truly progressive. To such as hold this view it must surely be a great joy to know that in Convocation, a short time ago, Archdeacon Farrar suggested that the great need of the Church in the present day was a revival of monastic orders. Furthermore, they should be overjoyed to learn that in all probability the subject will be seriously discussed in Convocation in February next, and that men eminent in the Church have expressed most favourable views in regard to Archdeacon Farrar's proposal. The *Standard*, I see, has elicited opinions on the subject from the Archbishop of Canterbury and the Bishops of Lincoln, Southwell, London, Winchester and Chester, all of whom write in terms of approval of the proposal to revive Church brotherhoods.

Perhaps it is scarcely evident to all how the revival of true ecclesiastical art and architecture is of necessity to follow in the footsteps of a revival of monastic orders? Doubtless the demand for accommodation of orders of men, all earnest, enthusiastic, and devoted Churchmen, would stimulate the flagging energies of Gothic Revivalists, and give scope for the erection of buildings whose stones shall be placed one upon the other with something of that earnestness which accompanied the erection of the old monasteries, priories, and abbeys; but to attain this earnest truth in design and construction, the architects' 5 per cent., and the contractors' visionary 10 per cent. must be foregone, and the brotherhood must itself become in a measure architect and builder. Viewed in this light one cannot think highly of the increased prospects of Gothic architecture that any revival of monastic orders would bring about. If such revival had been a cure for the decadence of Mediæval architecture, the few houses for religious communities in this country, erected in this century, would be something which it is self-evident they are not.

In all probability Archdeacon Farrar, whilst thinking of brotherhoods and orders, did not give a thought to *monasteries* as an architect would. To our matter-of-fact minds the suggestion of the revival of monastic orders brings with it visions of noble churches and quiet cloisters, vaulted dormitories, refectories, strangers' halls, &c. But I suppose a monastic order of the Church of England at the dawn of the 20th-century need not of necessity have a monastery having anything in common, either in arrangement or appearance, with a Mediæval institution. If it should have to bear any such likeness, I rather fancy the profession will be prepared, off-hand, to supply monastic plans at the shortest notice, seeing that we have all been sketching and examining little else but old abbeys, monasteries, and priories for the last thirty or forty years. We ought to know a little about them by this time.

"Merrily, merrily rang the bells, the bells of St. Michael's tower." That, however, was in years past. I should be inclined to believe, judging from the look of affairs, that they won't ring again in their old position. Most architects will agree with your view of the Coventry question, which, in point of fact, is identical with that expressed by Mr. James Brooks and the other gentlemen invited to give an opinion on the subject. At the same time, we cannot blame the hard-headed Philistine for asking why, in the name of goodness, the tower should not be modified to any extent that may be necessary to put it in a fit state to resist the strain of bell-ringing. He might with much reason argue that a tower should serve some useful purpose besides being merely an object of architectural beauty. Had my duties not been architectonic, I might have been inclined to back him up in his assertion, especially when remembering the doings of our forefathers, who often blocked up a tower-arch, door, or window with an ultimate effect of a superlatively picturesque order. Throughout nature the beautiful is, we know, subservient to the useful. Nevertheless, taking all things into consideration, one feels that the Coventry people will be well employed in letting the old structure alone, and allowing its venerable bones to have a little peace at their time of life. The inhabitants of Coventry would not care to have the tower come down about their ears. And those who remember the sections of it which you published some months ago will know that its construction may be described as bordering upon the "Pharaoh's lean kine" order, and does not in its sectional aspect give that appearance of massive stability that should be apparent at a glance in a belfry destined to withstand the swaying of ponderous bells.

St. Martin's, Ludgate-hill, is now threatened. Its destruction would certainly be regretted by all lovers of the picturesque, and by those who do not look upon its spire after the manner of Coleridge, who declared that it was always getting in the way when one wanted to obtain a good view of St. Paul's. Coleridge must have had some animus against the building. Not so old Strype, who says of St. Martin's that "it is very comely, and ascended up by stone steps, well finished within, and hath a most curious spire-steeple of excellent workmanship, pleasant to behold." I read that Robert of Gloucester, the rhyming chronicler, described the original St. Martin's as having been built by Cadwallo, a British prince of the 7th century, and that according to the old parish books a new church was built here in 1437. Wren's structure cost something over £5,000. It seems to me very probable that in designing the feature which Strype calls the "spire-steeple" Sir Christopher *did* have a studious regard for its resultant effect on the architectural mass above the crossing of St. Paul's. In the very many drawings and sketches in which the spire of St. Martin's has been represented grouping with St. Paul's dome, we may note the happy effect of their juxtaposition; and, examining the composition of the spire, we shall find a studied relation between its lower masses and the dome and its drum, &c. Even a little "golden gallery" is placed round a portion of the spire. Above this point, however, there is, of course, a total dissimilarity of outline, and herein, I should say, the art, if there be any, comes into play; for, by making some similarity between the dome, drum, &c., of the cathedral and certain portions of the spire, and by greatly exaggerating the upper part of the latter feature, something of added dignity is given to the distant swelling cupola. Be this as it may, and be the shade of Sir Christopher guilty of artful scheming, or absolutely guileless and disingenuous, the effect of beholding the two features in one *coup d'œil* is certainly very happy and pleasing.

Passing by the Holborn Town Hall, the other day, I noted the condition of the embyro thoroughfare, which, I see, is to be called the "Rosebery-avenue," in honour of the Chairman of the London County Council. It must be confessed there is not much of it; and the few square yards of what for the time is "no man's land" are not very cheerful in appearance. Adjoining it, however, Mr. Pilkington is erecting large blocks of dwelling on the "flat" system, in the design of which, and of many other blocks in different neighbourhoods, this architect is as busy as he can be. I understand that certain difficulties in connection with the completion of the first section of "Rosebery-avenue"—the section included between Holborn and Exmouth-street—having been overcome, its construction will shortly be continued, and, it is hoped, completed within a year. Ultimately, as all should by this time be aware, the new avenue will conduct up to the Angel at Islington.

Technical instruction has been now so much discussed in and out of Parliament that something tangible may be expected to result. Several Bills have, I believe, been promoted to deal with the question, which is one that should engage the attention of all architects. It appears to me that one great mistake that may possibly be made will be an attempt to combine the tuition on ordinary subjects in the Board schools with a form of technical instruction. A little thought should surely suffice so show the folly of making any such combination. To begin with, the idea seems to want weight and dignity. To suppose that the Board school scholars and Board school teachers will be suitable either for the acquirement or giving of the knowledge in question, is to fall into a great error. Compromises of this sort are sure to be attended, in the long run, with disastrous results. If we are to have a thorough, national system of technical education let it be distinct from, and out of hands of the members of, the School Board. They have quite enough to do to see that elementary knowledge is acquired by the pupils attending the schools. Let any measure dealing with the question—a vastly important question, according to those qualified to give an opinion on the subject—be brand new and unconnected with any person whose business and duties should leave him no time, if not positively *unfit him*, for matters of totally different concern. In my humble opinion, the subject of technical instruction requires long consideration from a committee of experts in various crafts, arts, and sciences, and then we should not have Parliament talking, as on Tuesday evening last, of technical education as if it were tied to the skirts of the old ladies, of both sexes, in the School Board.

"What's in a name?" we often ask one another. And we generally find there is a good deal in a mere name. Touching a proposal, mooted at a recent meeting of the British Medical Association at Leeds, that all keepers of hotels, hydropathic establishments, and boarding-houses in a town or other convenient district should form themselves into an association for the mutual sanitary protection of themselves and visitors, Dr. Allfrey writes to the dailies of the 21st stating that, in the opinion of himself and his co-operative colleagues, certificates, certifying the building to be in sanitary order, "should only be recognised when given by duly-qualified sanitary engineers, and not by any ordinary engineer, architect, builder, or plumber." Note the "lumping" of the e., a., b., and p. Evidently Dr. Allfrey is impressed by the term "sanitary engineer," which is often synonymous with *bunkum*. He forgets that the proper person to say whether a house is in sanitary order is, and should rightly be, the architect, and that the engineer, builder, and plumber, using the terms in their proper sense, have their own respective businesses to mind. GOTH.

CHIPS.

The town council of Newbury have appointed as borough surveyor and inspector of nuisances Mr. E. A. Stickland, late assistant borough surveyor of Reading.

The first sod of the new grammar school buildings at Bedford was turned on Tuesday week by the mayor. The schools will be situate in Glebe-road, and will be three stories in height. The large hall will measure 102ft. 6in. by 50ft., and the classrooms, in three tiers on either side, average 32ft. by 23ft. 6in., and 23ft. by 21in. Mr. E. C. Robins, F.S.A., is the architect, and Mr. Spencer has taken the contract at £23,000.

Mr. Bell, of Heaton Norris, has been appointed surveyor to the local board of Matlock Bath, in succession to Mr. Allen, who has left the neighbourhood.

The Surrey County Lunatic Asylum at Cane-hill, Coulsdon, is about to be enlarged in accordance with plans prepared by Mr. C. H. Howell, of Lancaster-place, Strand.

The chancel of the parish church of Hungerford, Berks, was reopened last week after restoration. The works have included a new lead roof and new east window of tinted cathedral glass, rearrangement of the flooring, raising of the sacrarium and relaying with Minton's tiles. The ceiling has been newly panelled in pitch-pine, new side seats and altar-rails have been provided, and two windows have been filled with stained glass by Messrs. Lavers and Westlake, of London; the subject of one is The Transfiguration, and of the other Our Lord as the Healer. Mr. J. H. Woolridge, of Hungerford, was the builder.

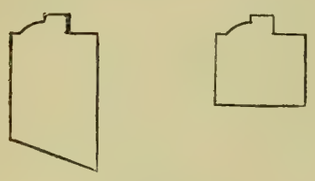
At the half-yearly meeting of the Lambourn Valley Railway Co. it was reported that progress is being made with this enterprise, which will open up a little known part of Berkshire. The contractor has possession of 11½ out of 12 miles of the land, about one-third of the total earthwork is completed, and 4½ miles of railway are ready for the permanent way. Mr. W. Gregory is the engineer.

CARPENTRY AND JOINERY.—XXI.*

WINDOW-FRAMES AND SASHES.

AND now, having made the sash-frame, a sash is required for it, and before proceeding with some of the varieties of the class of sash-frames just treated of, it is better to show how the sash is made. The elevation of the window-frame set out on a board affords the best opportunity of laying down the working lines of the sash—that is, of its elevation or height, and the plan of the frame will also serve for setting out the width of the sash upon. If this was done when the plan and elevation

Fig 147



3" Scale

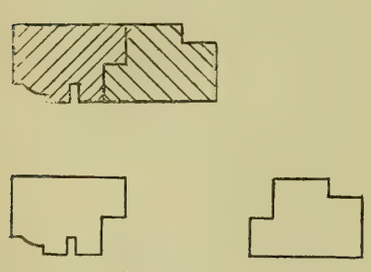
(height and width) of the window-frame were set out, well; but when the frame has been made the sizes should be tested in order to be sure that the internal measurement is what was intended, and if any alteration has occurred the change should be made either in the plan and elevation already prepared, or a lath may be used to set out the height and width of the *sash* only, and for this purpose a lath 2in. wide, and of the required length (a little over the extreme height of the sashes), is all that is needed; ½in. thick, or less, will suffice.

Fig. 147 gives a section of the sill and of the top and stiles suitable for and commonly used in such sashes. It will be seen that the sill on its under edge is bevelled to suit the inclination of the sill of the frame.

The upper edge of the sill has a moulding for ornamental purposes, which is usually turned to the inside of the apartment, and a rebate to receive the glass and putty. The section of the stile and head shown in Fig. 147 is found upon measurement to be of the same dimensions both ways.

Fig. 148 gives sections of *meeting rails* top and bottom as they are; first of all, when they are in their relative position in the completed and fitted sash; and beneath they are shown separately, the one which has the moulding and a

Fig 148



3" Scale

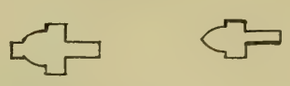
groove for the glass being that belonging to the bottom sash, and the other having rebates only is that of the upper sash. If each sash has only one square of glass in it, then the sections shown in Figs. 147 and 148 are all the sizes of timber required; but if, as is not unfrequently the case, each sash has two or more squares of glass in it, then *bars* are required, sections of which are shown in Fig. 149.

On the left-hand side is shown the section of a *bar*, which is commonly used when only one is put into each sash, whether *upright* or *horizontal*; and on the right hand is the section of the one used when each sash is divided into a number of squares—say 4, 6, 8, 12, or any

* All rights reserved.

number greater than these. The usually great object in the making of sashes is to combine strength and lightness, so that in ordinary sashes no superfluous wood is allowed. The moulding shown in Figs. 147, 148, and 149 is what is

Fig 149



3" Scale

commonly known as a *Gothic sash mould*. This and the *lamb tongue* are most commonly in use. It is generally a well or elaborately-fitted house or edifice in which other mouldings than these are adopted for the sashes, and then the sashes are usually moulded to match the mouldings of the doors, &c.

It may be well to mention, that for the *Gothic* and *lamb-tongue* mouldings these can be bought *sash scratches*, which have all the allowances required for setting out the *stuff*. It may be well also to note that a ¾in. Gothic *works* ¾in. *over or on* and ⅝in. down, and a ⅝in. works ⅝in. over and 1⅛in. down, and the rebate is usually as deep as the working of the plane, ⅜in. and 1⅛in. respectively. Knowing the above matters of detail will aid very much the beginner in *setting out* sashes. Having the timber cut up for making the sash, of course some allowance must be made for *planing up*, and extra length should be allowed, which is needed to prevent the mortising and wedging up from splitting the ends of the stiles. If the sash is to be all *hand made*, it will be neces-

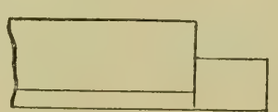
Fig 150



3" Scale

sary for the joiner to plane up the timber so as that the *run of the grain* will suit the *working of the plane and filletster*; but if the rebating and moulding are to be done by machinery, it must be *planed up* to suit. If, however, the material is brought to the joiner all ready prepared by the machines to the sections required, the above remarks about *planing up* do not apply. In a window having two sashes in its height and one square of glass in each sash, the *meeting rail* is so arranged that the glass in each sash is of the same size; which is done by having the meeting rail in the centre between the inside of the sill and the inside of the head of the sash. Sometimes, however, it is necessary to guard against the meeting-rail being on the level of the eye; then, knowing the height the sill of the sash will be from the level of the floor, the workman can arrange the matter

Fig 151



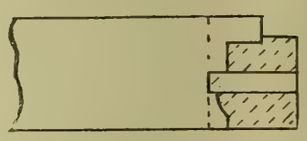
3" Scale

by making the bottom sash longer, thus putting the meeting-rail at the required distance from the floor level. All these points being settled, and the elevation set out in accordance with them, the joiner proceeds to put the working lines on the timber, and if hand-planed, this is done before any rebating or moulding (sticking) is started on.

Now, Fig. 150 is the section of the stile to show where the mortise and tenon occur in plan (shown by dotted lines), that is just where the *square* occurs between the moulding and the rebate, and which is the size of the mortise and tenon which can be made. It will be often found that the above arrangement puts the tenon out of the centre; but that makes little difference, as it is usually only an ⅛in. or ¼in. Fig. 150 shows also the *scribing* of the ends of head and sill (to the left).

The working lines are transferred from the

Fig 152

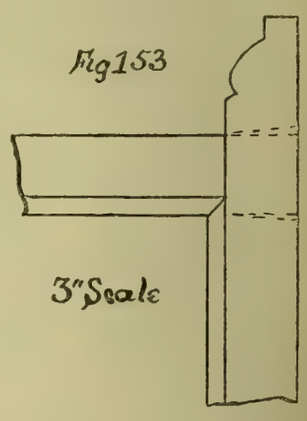


3" Scale

elevation unto one of the bottom stiles, all the lines needed are those showing the full size of the meeting rail and sill (when there is only one square of glass in the bottom half), and these in their correct position, and on what has been marked for the *inner edge*, then allowance is made at the sill for haunching, as much as possible being allowed and not less than an inch. The meeting-rail is mortised for full size; another provision is also made for the meeting-rail, which will be dealt with presently. The lines are *squared* over from the inner to the outer edge, and allowance made on the outer edge for *wedge-room*. The other stile is set out from this one *and to match*, that is, it must be its fellow. The top stiles are similarly set out from the elevation being made also *matches*.

Fig. 151 shows the haunching allowed, and consequently the size of tenon, and also that the inner edge of the head is the inside edge of the tenon; this follows on account of the tenon occurring at the square between moulding and rebate, and thus the size of the head is not reduced at this part. This is similar to the arrangement at the sill, only in the sill more haunching is allowed. The *cross stuff*, that is, sill, head, and meeting-rails, is now taken in

Fig 153



3" Scale

hand, and set out from the plan. The inner lines are put on with a pencil, but those showing the allowance made from scribing and rebate are put on either with the *scratch* or with a draw-point; these are all lined on the inner edges, which means the moulded ones, and, of course, are all of equal length; an additional line is put upon the meeting-rails at each end, 1⅛in. from the pencil line; this line is squared over to the *back side* in the bottom meeting-rail, by the *back side* is meant that opposite to the spectator standing inside the apartment, and in the top meeting-rail is squared down the front side.

The object of this line being thus put on is, that the meeting-rail may be cut at this length

a little way in, the use of which will now be shown.

Fig. 152 shows a cross-section through the stile (at the meeting-rail), and a longitudinal section through the meeting-rail itself; across the meeting-rail is drawn a dotted line, which is the line which should be drawn on the cross stuff in pencil; the 1⅛in. from this line is seen furthest from the reader, and extending towards his right hand; it is seen that this leaves a projection which is needed for the parting bead, and as the sash slides up and down the *projection* slides against the parting bead; practically a little freedom is allowed, so as not to rub off the paint. It is seen also that this is sunk ⅛in. into the stile, which seems to strengthen it, and in the case of shrinkage is not unsightly; the tenon is shown, and the part of the stile not occupied with the tenon has sectional lines through it. The stiles have a check taken out for this part of the meeting rail; in the bottom stiles it is out of the back side, and in the top stiles it is out of the front side. Fig. 152 is a section through the bottom sash. The reader can exercise himself in getting out a section through the *top* sash at the similar part to that of the bottom sash which is shown in Fig. 152. He will note the projection of top meeting-rail will be towards himself, and that the meeting-rail and stile will be in one straight line on the side furthest from him. One other matter must be attended to: beyond the mortise for the meeting-rail there should be sufficient timber left on in order to work an ornamental joggle such as is shown in Fig. 153. This is why the mortise can be of the full size of the meeting-rail. These joggles are of a great variety of forms. In the working of these joggles, the stiles are all put together, side by side, and the joggles are wrought *across the grain*, being held tightly together by a cramp or other appliances. They are wrought to the required shape by *hollows and rounds*, and before they are separated they should be neatly sandpapered. Note particularly the scribings shown in Figs. 150 and 152 as the head, sill, and bottom meeting-rail are worked to them respectively. When all the work has been performed, and the tenons of head and sill cut to their proper sizes, the inner edges smoothed, also those parts of the stiles which, on account of the projection of the meeting-rail, cannot be smoothed when the sashes are together, the sashes are ready for driving together, which is easily done. They are then laid aside to dry, care being taken to prevent them from being twisted.

The wedging, pinning, and grooving for rope, ribbon, or chain, by which the weight is suspended, will be taken up afterwards.

THE FURTHER STRENGTHENING OF ST. MICHAEL'S STEEPLE, COVENTRY.

CONSIDERABLE agitation has been going on in Coventry since the decision of the St. Michael's Restoration Committee not to replace the bells in the tower. Ever since the great work of restoration, carried out by Mr. Thompson, contractor, Peterborough, has approached the final stage, the question has been constantly asked: "Will the tower carry the bells so as to allow of their being rung in safety?" The lower the scaffolding has been taken down, the greater the anxiety has been to arrive at a solution of the difficulty. By special invitation of the Restoration Committee, a deputed committee of the hon. consulting architects of the Incorporated Church Building Society made a careful inspection of the tower on the 2nd of May last. The gentlemen upon whom this devolved were Messrs. Ewan Christian, R. Herbert Carpenter, James Brooks, William White, and John P. Seddon. Messrs. Taylor and Co., the eminent bellfounders of Loughborough, also accompanied the architects, and made a thorough, though an independent, examination. A fortnight ago their report was presented to the Restoration Committee, meeting under the presidency of Lord Leigh. The architects reported their unanimous conclusion that the tower at present is not sufficiently strong to receive, for the purpose of ringing, the peal of bells desired to be rehung therein. If the Restoration Committee decided that the bells should be rehung, then various additional strengthening works must be executed, including the replacing of the north and south windows in their external and internal arches by solid masonry throughout the whole thickness of the wall, combined with powerful central buttresses of adequate width and projection carried up to the springing of the windows on the second story of the tower, or about 60ft. from the level. Other necessary work was also pointed out.

Although not unanimous on the point, the committee of architects, as archæologists, expressed the opinion that the proposed work would interfere with the authentic design of one of the finest towers in England. Mr. Ewan Christian, however, dissented from the latter view. The opinion of Messrs. Taylor also went against the rehanging of the bells in the present condition of the steeple. All, however, were unanimous in praising the excellent manner that the restoration had been carried out by the contractor and the clerk of the works, Mr. J. R. Webster. There was a lingering love for the old bells to go back, somewhere or somehow, felt by many of the committee. At all turns and to all suggestions there were objections, if not downright opposition. Mr. Woodcock, a munificent contributor, would pay half the cost of a separate bell-tower, but not one halfpenny towards defacing the present magnificent and unique structure. Lord Leigh was equally as emphatic against a separate bell-tower, and the Rev. Dr. Mills, the Vicar of St. Michael's, also had strong objections to raise concerning the freehold. Probably the financial aspect of the present restoration affect the whole question. The contracts amounted to £34,200, of which £28,150 had been paid. A deficiency of £4,900, for which no guarantees were in hand, stared the committee in the face. Mr. Oldrid Scott gave his opinion that if chiming would be satisfactory the whole peal of bells might safely go back. But the item of cost again came out, and the committee decided to adhere to a previous resolution to close the contracts, and leave the bells down.

Since then the subject of the bells has never been forgotten. Rumours of a public meeting of the citizens have been freely in circulation. The subscribers, many of them, talk of further action. There is certainly a strong consensus of opinion that the bells ought to go back. The grand work of restoration suffers in the public estimation because of its silent—though thrice beautiful—tower. Within the last day or two considerable impetus has been given to the consideration of the whole question by a remarkable published letter of Mr. G. R. Webster, the late clerk of the works to Lord Leigh. No one knows more of the steeple than Mr. G. R. Webster, and his views are naturally looked to with great respect. He suggests a scheme for strengthening the tower that he claims will add inconceivable strength to the steeple without disfiguring it in the least. His proposition is that wrought-iron bands and plates should be built into the horizontal joints of the interior faces of the walls, in such number and at such distances apart as may be found desirable, well bedded and pointed up in pure Portland cement. He argues, it is well known that iron built into walls will never rust or corrode; that Portland cement has an affinity for iron, as it has for stone; and that the only problem to be solved is one of simple multiplication. "Put," he says, "as many of these bands into the walls as will make the steeple strong enough to allow the bells to be rung up in full peal in the octagon." The ringers' floor, he suggests, should be just above the groined ceiling, thus keeping the lovely interior intact. Before the walls can crack, the iron must break, and the tensile strength of iron, he points out, is so great, that such an event is utterly impossible. He totally denies that the bells had anything to do with the former cracks in the steeple; they were caused, he says, by the bad foundation. This has been underpinned, and thoroughly reset.

Mr. Webster suggests that his lordship should invite all the builders and clerks of works in Coventry to meet and discuss his scheme. Further, so sanguine is he of its success, that personally he extends a welcome to any meeting, whether it be the Restoration Committee, the builders and clerks of the works of Coventry, the subscribers, the whole of the citizens, the Clerks of Works Association, or another consultation with the architects of the Incorporated Church Building Society. However, Mr. Webster has gained one point towards a discussion of his scheme, for Lord Leigh has just written saying that he has asked the secretary of the Restoration Committee to call a meeting to consider his proposition. Meanwhile, the result is awaited with renewed interest.

Building Intelligence.

GORTON, MANCHESTER.—New public baths are about to be erected for the Gorton Local Board at the corner of Queen's-road and Hyde-road. The architect is Mr. T. H. Maybury, Booth-street, Manchester, whose design was selected from among 37 received in competition. The front elevation of the baths is 84ft. long, and will be carried out in brick, with dressings of stone and terracotta, with central tower, flanked by two gables with terracotta pediments. The first-class and second-class swimming baths have separate entrances. There is a provision on the first-class swimming bath front for five slipper baths, and space for six others to be added hereafter. The swimming bath is 75ft. by 25ft., and is 6ft. deep at one end, with a gradual rise to 3ft. at the opposite end. Dressing-boxes are provided for 54 bathers. A gallery extends around the bath for the use of spectators, to which a separate entrance will be provided. The bath will hold 52,582 gallons of water. This second-class bath is 60ft. by 25ft., with water capacity of 41,066 gallons. Like the first-class bath, it will be 6ft. deep at one end and 3ft. at the other. The dressing-boxes are 42 in number. A preliminary bath is provided, 8ft. by 3ft. 6in. There are also in this department 10 second-class slipper baths.

LEEDS.—The foundation-stone of the new headquarters for the 2nd W.Y.V. Royal Engineers was laid on Saturday, the 17th August, by Mrs. Dawson, of Weston Hall. The trowel was presented to her by the mayor on behalf of the officers. The plans have been prepared by Mr. William Bakewell, architect (who is an officer in the corps), and will be carried out under his supervision. The cost of the buildings will be £4,000. The contractor is Mr. Joseph Pullan, of Leeds.

CHIPS.

New church schools for 365 children are about to be built for the parish of Holy Trinity, Parkfield, near Middleton, Lancs. Mr. A. Banks, of Oldham, is the architect, and the outlay will be about £1,000.

The Shardlow rural sanitary authority have accepted the tender of Messrs. Holmes Brothers at £1,500 for carrying out sewerage works at Draycott, Derbyshire. The work will be carried out from plans by Mr. W. H. Radford, of Nottingham.

The Colonial Farming College in Hollesley Bay, Suffolk, has proved so successful that an additional wing is to be added at a cost of £2,700. Messrs. Giles, Gough, and Trollope, of London, are the architects, and Mr. Smyth, of Aldeburgh, is the contractor.

Extensive structural alterations and additions have been made to the Stockton racecourse buildings in preparation for the meeting opened on Tuesday. They include a luncheon-room, 58ft. by 25ft., with serving-room adjoining, the increase of the stewards' stand to three times its former length, new secretary's office, weighing-room and jockeys' dressing-room, while the paddock has been increased and laid out as a lawn. Mr. Eugene E. Clephan, of Stockton-on-Tees, carried out the works.

The operative slaters of Airdrie and Coatbridge struck work on Monday, a demand of ½d. per hour increase in wages having been refused by the employers.

An anonymous donor has given £10,000 towards the establishment of the new Bishopric in South Wales, conditional on the head-quarters of the new see being at Swansea.

At the half-yearly meeting of the Forth Bridge Railway Company, held at Edinburgh on Tuesday, Lord Colville said that the bridge was approaching completion. The great cantilevers were practically finished, and the central girders were being put into position. The directors hoped to be able to walk over the bridge in October, and if the approach lines were sufficiently advanced, they would be able to use the bridge for goods and mineral traffic early in 1890.

A limited liability company is being formed, with a capital of £15,000, for the purpose of providing Cheltenham with a theatre.

An addition has been made to the fittings in Norwich Cathedral in the form of a new altar rail, which is of wrought brass, over a surface of blue cloisonné enamel. The brasswork is intersected and enriched with bosses or medallions of agate and other stones, and is supported by double columns of coloured Devonshire marble, fixed in a similar marble base.

COMPETITIONS.

Leek Cemetery Extension.—We regret to find that this competition must be added to the long list of those which have been mismanaged and muddled. In June last, it will be remembered, the Leek Improvement Commissioners selected, from eleven competitive designs for laying out the ground recently added to the cemetery, that sent in under motto "Out of the Noise." It proved to be by Messrs. William Sugden and Son, of Leek, and they were duly awarded the premium of £25. In all fairness, Messrs. Sugden should have been appointed architects for the extension, especially as the existing cemetery was laid out and the chapels built from plans by Mr. Sugden, sen., and Messrs. Sugden stated in their report that Mr. Matthew Mellor was prepared to undertake the planting at their estimate, and, in conjunction with Mr. Thomas Frost, to similarly carry out the road-making, drainage, &c. The commissioners, however, at their last meeting adopted a report by a committee, recommending that the premiated plans be cut down, the planting of trees, and provision of alleys between grave spaces, of verges round walks, and of a rain shelter, being omitted, and that plans and specifications so revised be prepared by Mr. John Myatt, the town surveyor. Some members pointed out that, independently of its unfairness, the recommendation had not even the merit of economy to recommend it, as the surveyor's department was notoriously overworked, and that the proposal would ruin the appearance of the grounds for all time, although purchased at a cost of £500 an acre. The majority of the commissioners regarded the matter as one solely, as one member said, of £ s. d., and the recommendation was adopted. The question is one of wider interest than Leek and its commissioners, and such shabby treatment of professional men, whether dictated by the commissioners' desire to gain votes at the next election from parsimonious ratepayers, or from simple ignorance of what constitutes fair dealing or good faith, deserves to be pilloried. Conduct of this kind tends to lessen confidence in local government, and to keep architects of good standing out of competitions.

Sheffield Municipal Buildings.—The sub-committee appointed by the Improvement Committee of the Sheffield Town Council to consider the conditions of competition for the projected municipal buildings held a meeting on Monday, which was also attended by Mr. Alfred Waterhouse, R.A., P.R.I.B.A., who has accepted the position of architectural assessor. A long discussion took place with regard to the framing of the conditions, and it was decided to advertise forthwith for designs.

Swansea Market Buildings.—In the competition for designs for new market buildings in Oxford-street, Swansea, to cost about £20,000, the assessor has placed the design under the motto "Prosperity"—the authors of which are Messrs. J. Buckley Wilson, F.R.I.B.A., and Glendinning Moxham, M.S.A., architects, of Swansea—first, with a premium of 50 guineas. Over 20 sets of designs were sent in by architects from all parts.

Swindon.—In the competition for a new board school, to accommodate 530 children, the plan of Mr. Brightwen Binyon, F.S.A., of Ipswich, has been selected. The estimated cost is £3,120. Mr. Binyon is the architect of five other board schools built at Swindon.

Taunton.—The premium for the second-best scheme for the prevention of floods in the borough of Taunton has been awarded, under the advice of an expert, to Mr. W. H. Radford, civil engineer, Nottingham. The scheme includes the provision of rows of flood-gates at every weir, with special flood-cuts and river widenings and deepenings; also now iron bridge of three spans over the Tone.

At a special meeting of the town council of Bradford, held on Tuesday, it was decided to adopt the Nidd Valley scheme for the future extensions of the waterworks. The proposal is to construct an aqueduct, including some heavy tunnelling operations, from the Nidd Valley, a distance of 17½ miles. The yield is estimated at 17½ million gallons per day, and the cost at £107,220.

The erection of the superstructure of the new asylum of the London County Council at Claybury, Woodford, Essex, is about to be commenced. Mr. George T. Hine, of Nottingham, is the architect, and the asylum will accommodate 2,000 inmates.

Engineering Notes.

Eyemouth.—The new branch line from the North British Railway system to Eyemouth Harbour, a distance of three miles, was commenced a month since. The engineers are Messrs. Thomas Meik and Sons, Edinburgh and London, and the work of constructing has been let to Messrs. W. Beattie and Sons, contractors, Edinburgh. The new line branches from the Edinburgh to the Berwick main line of the North British Railway at Burnmouth Station, runs parallel with it in the direction of Ayton for about half a mile on the existing railway embankment, then strikes towards the sea. The river Eye and Eyemouth mill lade are crossed by a viaduct of six spans, each of 55ft., with a height of 50ft., and a total length of 350ft. The viaduct will consist of five piers built of brick walls and concrete filling, resting upon foundations of concrete. The superstructure will consist of iron girders with timber flooring. The permanent way will be of the same description as that used by the North British Railway. The length of the line is nearly three miles; the principal cutting will be 37ft. in depth, nearly all of rock, and the highest embankment about 40ft. There is a fall the whole way of in all some 250ft., and the steepest gradient is 1 in 50. The railway will be opened a year hence. Mr. A. K. Mackay is resident engineer, and Mr. W. Inglis is contractors' agent.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

York Architectural Association. — The second visit of this association took place on Saturday to Gilling, when, by permission of Major Legard, the ancient and interesting portions of the Castle were thrown open for inspection. The architecture of the Castle may be divided into the Mediæval and the Classical Renaissance. The Mediæval portion consists generally of the dungeons, the dinning-room, and the eastern part. The Renaissance portion, which is by far the largest, and was the work of Sir John Vanbrugh, comprises the two wings and entrance, and includes the entrance hall, drawing-room, gallery, music-room, billiard-room, &c., with all rooms over the same. A large portion of the ancient castle has been removed, to make room for the modern buildings, which are partly built upon the old dungeons. The dining-room is by far the most interesting portion of the ancient castle remaining. It has a remarkable ceiling, which has numerous traceried pendants, and large mullioned windows filled with glass, on which are painted shields bearing the arms of the Fairfaxes, Constables, and Stapletons. On one window is the date 1585. The walls are lined with oak panelling of the Queen Anne period, the original wainscoting having been removed. Above the panelling is a curious frieze painted on boards, and executed by the four daughters of General Fairfax, which represents the arms of all those who were entitled to armorial bearings in the different wapentakes of Yorkshire. The billiard-room was originally the chapel. The decorations throughout were executed by the late John Gregory Crace, of London, in 1846, and the late Mr. Worthington, of York.

Workmen have commenced the demolitio n of the railway-station at Llantrisant on the Great Western and Taff Vale Railways preparatory to the erection on its site of a station more in accordance with modern requirements. The new station will be 43ft. longer than the old structure, and the platforms, at present much below the level of the carriage floors, are to be raised 2ft. 9in. The contract for erection has been let to Messrs. Woodhouse and Geen, of Southampton and Newport (Mon.), who are locally represented by Mr. Treharne Treharne, of New Park, near Llantrisant.

Three valuable pictures have been bequeathed to the Birmingham Fine Art Gallery by the late Joseph Beattie—viz., a study entitled "Where is it?" by Mr. H. S. Marks, R.A.; and two landscapes, "Gentle Autumn," by Mr. Frank Walton, and "October in the Isle of Arran," by Mr. J. McWhirter, A.R.A.

The Marquis of Bute is going to build a Præmonstratensian monastery for the Fathers of the Canons Regular near Whithorn, in Galloway. There will be a model farm and orphans' home in connection with the monastery.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., LIV., and LV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Received.—M. Bros. and Co.—J. J.—T. H. B.—B. and R.—M. M. and Co.—Y. and Co.—M. T. H. M. Co.—F. and Son.—V. R. D.—J. R.—A. L. and Co.—M. and D.—P. of D.

B. B. (We described the new process of decoration only a few weeks since. A public company for working it has, we believe, since been floated—at least, the advertisements appeared in the daily papers.)

Correspondence.

THE ARCHITECTURAL ASSOCIATION.

To the Editor of the Building News.

Sir,—A thought occurs to me which I have reason to believe will meet with a cordial response:—that an annual summer excursion for younger members should be arranged for.—I am, &c.,

London, Aug. 20. Arthur W. Earle.

The preliminary steps in Lord Grimthorpe's action to prevent Mr. Henry Hucks Gibbs from restoring the Lady-chapel in St. Alban's Cathedral took place on Thursday, the 15th inst., before Mr. F. H. Jeune, Q.C., the chancellor of the diocese. Lord Grimthorpe was represented by Mr. Bright, and Sir Walter Phillimore represented Mr. Gibbs. The proceedings were merely formal, and were taken in order to arrange the conduct of the case, the hearing of which has been postponed till after the Long Vacation.

New school buildings just added to the Grammar School at Morpeth were formally opened on Thursday, the 15th inst. They include a new school-room, connected with the old room—now divided into two classrooms—by a wide corridor, and a chemical laboratory. Messrs. Boolds and Hardy were the architects.

The Cardiff corporation have decided to carry out various improvements and extensions at the Free Library, Museum, and Schools of Science and Art, from plans by Messrs. Seward and Thomas, the architects of the buildings. The outlay will be about £10,000.

Intercommunication.

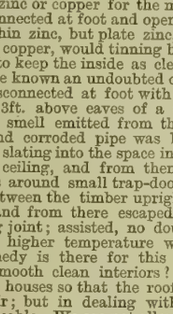
QUESTIONS.

[10065.]—**Tables of Compound Interest.**—On referring to page 420 in the "B. N.," March 30th, 1883, the reply to inquiry No. 7418, re "Deterioration in Value of Leases," I see the advice is "to get a table of compound interest." As there are so many different publications, I should feel obliged if any of your readers could advise me as to whose publication will answer the purpose best.—Egroeg.

[10066.]—**Soil-Pipes.**—Lead is soft and liable to cripple by expansion and contraction. Iron corrodes and gets very foul inside. Would Mr. Buchan or some other of your able sanitary correspondents give their opinions as to the use of zinc or copper for the material of outside soil-pipes, disconnected at foot and open at top? By zinc I do not mean thin zinc, but plate zinc, as thick, say, as 7lb. lead. If of copper, would tinning be any advantage? It is important to keep the inside as clean and smooth as possible. I have known an undoubted case of a 4in. cast-iron soil-pipe disconnected at foot with a Buchan's trap, carried at top 3ft. above eaves of a span slated roof, where the foul smell emitted from the top of the internally foul and corroded pipe was blown by certain winds under the slating into the space in the roof between slating and top ceiling, and from thence found its way through crevices around small trap-door in ceiling, and down spaces between the timber uprights of a lath and plaster ceiling, and from there escaped into room below through skirting joint; assisted, no doubt, by the action induced by the higher temperature within the house. What other remedy is there for this defect other than soil-pipes with smooth clean interiors? Of course, it is possible to build houses so that the roof covering is impermeable to air; but in dealing with existing houses this is not practicable. We are not allowed to reconstruct a large roof area to enable us to properly fix a soil-pipe. —R.

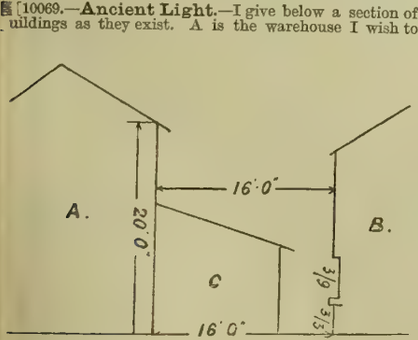
[10067.]—**Workhouse Plans.**—Will any reader inform me of the best modern work on the requirements and planning, &c., of "unions," and oblige?—Poor Law.

[10068.]—**Lights.**—Could any of your readers give me any information on the following case? B. pulls down his wall from *a* to *b*, and rebuilds his house, inserting entirely new windows of increased size. Does such increase of size and new windows in any way vitiate his



right to the lights hereto enjoyed? A. has a two-story building, and he wishes to raise his building another story higher. Seeing that B. has altered the character of his windows, can A. increase the height of his building if it reduces the value of light to B.'s windows? Do you know of any case recently decided of a similar nature?—Light.

[10069.]—**Ancient Light.**—I give below a section of buildings as they exist. A is the warehouse I wish to



raise, say 6ft., for another floor. B is the workshop of another owner, with the ancient light as shown. What I wish to know is, whether I can raise my warehouse A, which is already 20ft. high from the ground, and if so, how much; and also whether the fact that the lean-to building C belongs to a third owner will affect the question.—Builder.

REPLIES.

[10039.]—**Right of Way under Altar.**—Dr. Lee's view that the singular crypt beneath the chancel of this magnificent church is merely a chapel hardly explains the peculiarity of its having a grand north and south recessed portal immediately opposite each other. A study of the wills of "men of Kent" often clears up local peculiarities. Thus mention is found not unfrequently that the testator is to be buried "in the procession path," or, again, "in the churchyard near the chappel of St. Mary-of-the-Botteras." The procession path in nearly every instance immediately surrounded the church, and was kept clear of grave crosses, such as were alone in use till the 16th century. Now, it would appear that the eastern end of Hythe Church was, as at present, built on the extreme margin of the churchyard, so that no procession could pass entirely round without going through the crypt, and this is further borne out by the fact that even the set of buttresses assisting the east wall with its splendid triplet are all pierced to admit single-file persons walking past. A close inspection of the wall beneath and between the east windows of the crypt passage does not show that there existed any altars, and there would hardly have been room enough for them. An examination westward has revealed that the present vaulted passage does not extend in that direction. Now that the ground has been lowered to its original level, and the north crypt door is seen to its full height, this explanation of its use is quite obvious.—Francis Grayling, Sittingbourne, Kent.

[10056.]—**Wenlock Abbey.**—I thank "M." for his kind reply to my question. Parker's "Domestic Architecture," to which he refers me, I know only gives the plans and sections of the Abbot's House, while the plan I wish to see is that of the abbey. I shall still be glad to know if this can be found in any publication.—M. C.

CHIPS.

Referring to our illustration and description last week of the Southwark and Vauxhall Water Company's new premises, we should have mentioned that the basements are illuminated by Hayward's patent semi-prism pavement lights.

The committee of the Mansfield and Mansfield Woodhouse Hospital have instructed their architect, Mr. R. Frank Vallance, of Mansfield and Nottingham, to obtain tenders for the proposed hospital buildings to be erected in Mansfield (the design for which was selected in a limited competition), it being intended to proceed with the work with as little delay as possible.

No Grand Prix de Rome for Architecture has been awarded this year; a Premier Second Grand Prix has been given to M. C. D. Despradelles.

St. Mary's parish church, Burford, near Tenbury, which has been restored by the Hon. Miss Rushout, in memory of her brother, the late Lord Northwick, was reopened on Friday. The tower has been refaced with stone, new buttresses and parapets have been added to the building, and the ground has been lowered all around the church. An altar of polished marble has been placed in the church. An elaborate screen, pulpit, and pews, all of carved oak, are among the special features of the restoration. The works have cost between £6,000 and £7,000.

The general committee appointed to establish a national memorial at Plymouth in celebration of the Tercentenary of the defeat of the Spanish Armada has intrusted the commission to Mr. W. C. May. The monument will be unveiled in sections as funds come in. The memorial, which will be cast in bronze, and erected on the Hoe, near Mr. Boehm's statue of Sir Francis Drake, will be about 60ft. high.

The other day, while the workmen of Messrs. Wilkie and Graham, builders, were removing a part of an old wall in a close leading off the High-street, Peebles, they discovered a stone font built into the wall. The font was in two portions, but on being put together it was found that it was nearly perfect, and in a good state of preservation. The font is in the possession of Mr. Wilkie, Hayfield, Peebles.

The jubilee of the Roman Catholic Church at Hereford, a building Doric in style, has been celebrated by the decoration of the edifice and its renovation, works carried out by Mr. Barber, of that city, at a cost of £500. The reopening services took place last week.

The City church of St. Andrew-by-the-Wardrobe is undergoing extensive repairs and alterations. The contract has been undertaken by Messrs. Dove Brothers, under the superintendence of Messrs. Bodley and Garner.

The parish church of St. Mary, Bilston, Staffs, is about to be restored at a cost of £1,000, from plans by Mr. T. H. Fleeming, of Wolverhampton, diocesan architect.

At their last meeting the Southport town council discussed for four hours the proposed improvements on the foreshore. Two schemes were brought forward, one estimated to cost £68,755, the other £47,816. Both included the widening of the promenade, and the provision of one or more additional lakes. No decision could be arrived at by the members, and it was eventually agreed that the plans should be hung up in the town hall, and that a circular be sent round to the ratepayers submitting a series of questions, and giving a date at which the replies would be called in.

A course of instruction for apprentice plumbers will be given at the Merchant Venturers' School, Bristol, between the 1st October and the end of April. The course will comprise subjects specified in a special syllabus prepared by the Plumbers' Company. It will be assisted by demonstrations in the chemical laboratory, and will be followed by examinations. Prizes will be awarded to successful candidates by the Company.

Our Office Table.

The draft revised charter proposed to be granted to the Royal Scottish Academy is being severely criticised in the Edinburgh and Glasgow newspapers, objections being raised to the financial changes contemplated, and, among other things, to the proposal to increase the amount of the funds set aside as a pension fund. A correspondent of the *Scotsman* says that if the R.S.A. is not to descend to the level of a second-class picture-dealing business, the following, among other, reforms must be carried out:—An annual balance-sheet must be published, a proportion of the funds devoted to the encouragement and promotion of the fine arts, all financial transactions to be under the supervision of the Board of Manufactures, the associates to have a voice in the selection and hanging of pictures, and a business man—not an artist—to be appointed as secretary and treasurer. Another writer asks if it is possible that the name of so much respected a man as Mr. Dick Peddie is to be found on the pension roll as in receipt of a comparatively trifling annual sum, which surely, after more than ordinary success in his own career, he might well afford to despise.

Mr. Dick Peddie, as Chairman of the Charter Committee, replies to the various objections raised in a long letter which appears in Tuesday's *Scotsman*. He points out that the new Charter, so far from adding to the sum set aside for a pension fund, prohibits additions to the present amount, and further withdraws from the members the power hitherto possessed of dividing among themselves the profits of its exhibitions. As to the sum received by members, Mr. Peddie says the total amount paid to the officials, including the President and clerk, was £505, against £3,225 divided among the staff of the Royal Academy of London. When the draft Charter was being framed, a memorial signed by 68 artists outside the R.S.A. was received, asking that four reforms might be granted. Three of these are conceded in the new Charter, the only one withheld being a request that Associates should have a share in the hanging and selection of works in the annual exhibition, and this can be dealt with under the rules, which are subject to alteration at the discretion of the Academy.

The 32nd annual report of the Trustees of the National Portrait Gallery, just published, shows that several interesting additions have been made to the collection during the past year. Up to June, 1888, the numbers of donations had been 438, and this number has now been increased by fourteen portraits, among which are those of the following historical characters:—The Duke of Cumberland, the victor of Culloden, painted as a child by Charles Jervas; the Countess of Sutherland, daughter of the Great Duke of Marlborough, painted by Sir Godfrey Kneller; William Cowper, the poet, drawn by W. Harvey after L. Abbot; the Right Hon. John Bright, the well-known picture by Mr. Ouless, R.A., and two of Mary Queen of Scots, one taken at the period of her marriage with the Dauphin in 1558, and the other when she was wearing mourning for him in 1560—both were taken from life by Janet. To the 420 portraits acquired by purchase seven have been added. The first is a group of portraits representing the Court of Chancery, as held in Westminster Hall during the reign of George I. This picture, the work of a deaf and dumb artist, Benjamin Ferrers, was purchased for £115 10s. Amongst the other additions are Kneller's portrait of the famous Charles Montagu, Earl of Halifax; Wilmot, Earl of Rochester; Thomas Chiffinch; and Clarendon's second son Laurence Hyde, Earl of Rochester. If while buried at Bethnal Green Museum, this national collection is augmented by nearly a score portraits a year, it may be expected to be liberally supported, and will certainly be vastly more popular in future years when housed in Mr. Ewan Christian's building in Charing Cross-road.

The annual report as to a sister National Gallery, that at Dublin, has also just been issued. Mr. Doyle mentions that over 80,000 persons visited the gallery during the year, of whom more than one-fourth came on Sundays. Among the pictures purchased for the general collection were a large wooded landscape by Jacob Ruysdael, with figures by T. de Keyser; "A Halt of Soldiers," by Philip Wouverman; and a picture of "The Feast in Simon's House:

St. Mary Magdalen Anointing the Head of Our Lord," by Luca Signorelli. In order to enrich the National Historical and Portrait Gallery, eleven portraits of celebrities were purchased, among them being a portrait of Sir Walter Raleigh, Viscount Melbourne, Thomas Moore, John Wilson Croker, Laurence Sterne, Charles Lever, and a drawing in Indian ink of Oliver Cromwell. The donations received during the year included a gift of £1,000 from Sir E. Guinness to enable the Board of Governors and Guardians to obtain a selection of mezzotint portraits at the sale of the Chaloner-Smith collection. Two hundred portraits were purchased for £694. Lady O'Hagan presented a portrait in crayons of Lord O'Hagan, the Lord Chancellor of Ireland, and Sir C. Gavan Duffy presented a small plaster bust of Thomas Davis, modelled from life. It was resolved to introduce into the National Historical and Portrait Gallery autograph writings of persons therein represented from time to time as opportunities offered, and as the nucleus for such a collection, some twenty autographs were presented by Mr. R. Green, containing, among others, autographs of Grattan, Curran, Plunket, and O'Connell.

A survey has recently been commenced in Birmingham for the use of fire insurance companies, which promises to be of very great value both to the companies and insurers generally by greatly facilitating the transaction of insurances. The plans are to be drawn to a very large scale, each house being shown, and even the smallest shed or out-office. The building material will be indicated by different colours, as red for brick, yellow for wood, &c., and features which might affect the risk of the fire will be shown on the plans by various signs known to the insurance companies—viz., party-walls, iron doors, skylights, steam engines (with their power), boilers, chimneys, hydrants, &c. The survey is being conducted by Mr. Charles C. Goad, C.E., of London, who has completed similar surveys of large portions of the City of London.

The mammoth scaffolding employed for the building of the Australia Hotel, Sydney, erected by Messrs. Alex. Dean and Sons, is said to be a new departure in this kind of construction. It is 152ft. in height, and its square area is 47ft. The piers, or tripods, on which the platform rests, are 6ft. square. The large crane weighs 15 tons, and can lift 15 tons; the smaller cranes are 10½ tons weight, and carry 5 tons. The two jibs are 70ft. and 50ft. respectively in length. The workmen can ascend within the piers by ladders. A telephone communication is established from top to bottom. Labour is greatly saved, and risks of accidents considerably reduced. The same tripod arrangement has been in use in London and other towns for large buildings. The advantages are that when once erected the structure requires no further raising, the operations of lifting the materials are within the area of the building, and great saving of labour on scaffolding construction is effected.

The erection of a new bridge over Jesmond Dene, which was agreed to by the Town Council of Newcastle-on-Tyne, has been commenced. The structure will be constructed from plans by the city engineer (Mr. Laws) at a distance a little above the picturesque Old Mill. The bridge will have a span across the burn of 33ft., and the carriage way will be 18ft. wide. Stretching across the most picturesque and most interesting portion of the Dene, the new structure will afford a fine standing point of vantage to visitors to this charming public park.

The Queen's Arcade at Leeds is now on the point of completion. It connects Briggate and Landlane, and occupies the site of the Rose and Crown Yard and other properties; but part of the Briggate property will not be taken down till the leases expire, five years hence. The arcade is 17ft. wide on the ground-floor, and contains 26 shops with dwelling-houses above. Mr. Edward Clark, of the Strand, W.C., is the architect, and the contract for the whole undertaking has been carried out by Messrs. William Ives and Co., of Shipley.

A monument has been erected at the high end of All Saints' Cemetery, Jesmond, Newcastle-on-Tyne, over the resting place of a veteran teetotaler, Mr. George Dodds, formerly Mayor of Tynemouth. The monument, which is about 22ft. high, is of freestone from the Usworth quarries, with granite panels and pillars. Mr. J. B. Farbridge, Westoe, South Shields, executed the work.

Mr. Balfour will open the Public Library and School of Art at Hertford to-morrow (Saturday).

MEETINGS FOR THE ENSUING WEEK.

Monday.—Visit of Society of Architects to Cardiff. London members leave Paddington 1 p.m. Conversazione at the Town Hall, 8 p.m.

Tuesday.—Society of Architects. Excursion in brakes, 10 a.m. Special General Meeting of Members at Caerphilly Castle, Glam., 3.30 p.m.

Wednesday.—Society of Architects. Visit to Cardiff Castle and Docks.

Thursday.—Society of Architects. Excursion to Llantwit and Cowbridge.

Friday.—Society of Architects. Circular tour by rail to Chepstow, Tintern, Monmouth, and Raglan.

Architectural Association, 9, Conduit-street, W.—Members desiring any alteration of their addresses in the Brown Book are requested to send notice of same to Mr. Hampden W. Pratt, 6, Duke-street, Adelphi, before the end of August.

Frederic R. Farrow, Ernest S. Gale } Hon. Secs.

Trade News.

WAGES MOVEMENTS.

Weardale.—The limestone quarrymen of Weardale and Forcett have agreed to accept the advance in wages offered by the employers—viz., an advance of 5 per cent. in wages from July, and an additional 2½ per cent. advance (making 7½ per cent.) during August, September, and October.

CHIPS.

The will of the late Sir James Allanson Picton, F.S.A., architect, of Liverpool, has been deposited in the Liverpool District Registry. It directs the payment of an annuity of £300 to each of his daughters, Esther Allanson and Frances, and devises £12,000 in trust for his daughter Sarah Pooley Keogh.

About £6,200 has just been spent on the addition of two hospitals to Murray's Royal Asylum at Perth. The buildings are placed 100 yards apart. Mr. Heiton, of Perth, was the architect.

The new dock and railway at Seafield, near Kirkcaldy, have been commenced this week. Mr. Howard is the contractor.

On Tuesday week the Lord Bishop of St. David's consecrated the chancel of the parish church of Monkton Priory, Pembrokeshire. The chancel has been in a ruined state for about 360 years, and the part now restored completes the fourth section of the work of restoration. The portion now under notice has been carried out by Mr. Kenneth M'Alpin, of Pembroke Dock.

A new stained-glass east window has been erected in St. Andrew's, Congresbury, Somersetshire. The subjects are taken from the life of St. Andrew. The artists employed were Messrs. Bell and Co., of Bristol.

Mr. W. Harbrow's tender has been accepted for the erection of three corrugated iron school buildings for the School Board at Bromley, Kent, similar buildings erected by him in the same district last year having proved satisfactory.

The Sussex Archæological Society will hold their third annual excursion to-day (Friday), when Bignor, with its Roman tesselated pavements, &c., will be visited, and also Petworth.

Holloway's Ointment and Pills are never at fault in successfully disposing of skin diseases, scrofulous sores, and scorbutic affections. In all hereditary diseases these excellent remedies may be relied upon, and in them mothers the most delicate may become strong, the foulest blood may gradually be changed into the purest fluid.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

Aldershot.—For making new road through Major Newcome's estate. Mr. S. Friend, M.S.A., Aldershot, architect:—

Norris, W.	£1,175 0 0
Kemp, G.	1,149 0 0
Jeffries, T.	1,028 0 0
Martin, Wells, and Co (accepted)	860 0 0

Aldershot.—For the erection of 2 houses, Cargate Estate, for Mr. A. Thompson. Mr. S. Friend, M.S.A., Aldershot, architect:—

Kemp, G.	£742 0 0
Jeffries, T.	681 0 0
Martin, Wells, and Co.	650 0 0
Garland, W.	629 0 0
Piercy, W. (accepted)	550 0 0

All of Aldershot.

Ashton-under-Lyne.—For alterations to the Travellers' Call Inn, Portland-street. Mr. J. H. Burton, Warrington-street, Ashton-under-Lyne, architect:—

Williamson, J. W.	£126 0 0
Robinson, J.	119 10 0
Booth, R. H., Stalybridge	116 0 0
Dean, T.	116 0 0
Gardner, H.	115 5 0
Holmes, A. (accepted)	113 17 6
Cropper, J.	108 0 0

Rest of Ashton-under-Lyne.

Bournemouth.—For alterations to Avon Villa. Mr. H. E. Hawker, M.S.A., architect:—

George and Harding	£881 0 0
Hoare, F...	834 0 0
Jenkins and Sons (accepted)	825 0 0

Bournemouth.—For school building. Mr. H. E. Hawker, architect:—

George and Harding (accepted) ...	£1,970 0 0

Bournemouth.—For additions to Adelaide cellars. Mr. H. E. Hawker, architect:—

George and Harding	£1,767 0 0
Hoare, W.	1,750 0 0
Jenkins and Sons	1,678 0 0
Jones	1,500 0 0
Walden	1,489 0 0
James, C.	1,440 0 0
Barrow and Entwisle	1,410 0 0
Lucas	1,405 0 0
McWilliam and Son...	1,304 0 0
Hoare, F. (accepted)	1,287 0 0

Bournemouth.—For painting the Sanatorium. Mr. H. E. Hawker, architect:—

George and Harding (accepted) ...	£105 0 0

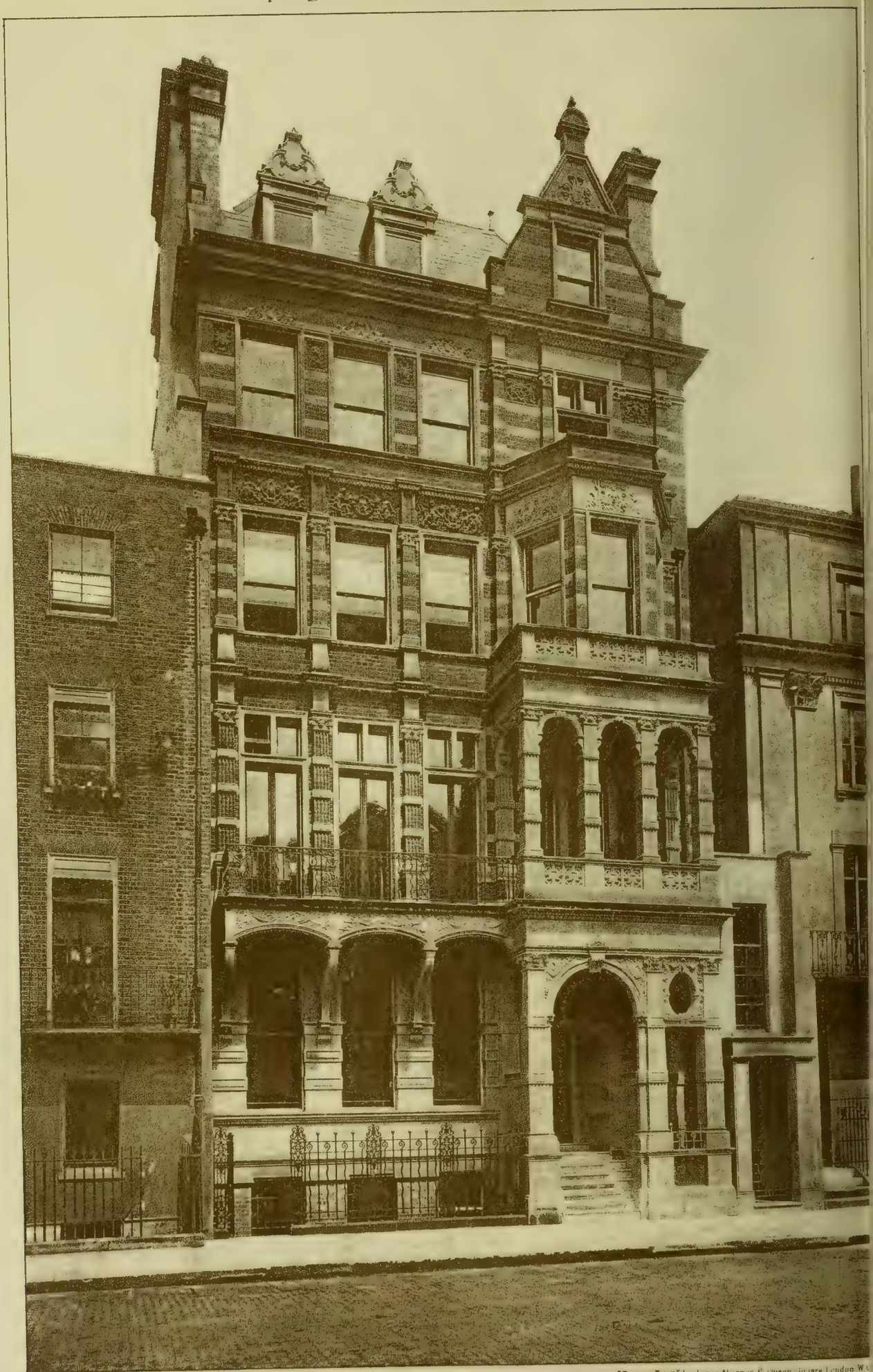
Bristol. For laying-out the land at Windmill-hill, East Bedminster, as a public park, the work to include construction of boundaries, removal of hedges, and construction of roads and footpaths:—

Hatherley, E. T. (accepted) ...	£1,170 0 0

(Only one other tender, £1,500, sent in.)

Bristol.—For a pair of semidetached villas, Trelawney-road, Cotham. Messrs. Foster and La Trobe, architects:

Wilkins, R., and Son	£1,598 0 0
Cowlin and Son	1,594 0 0
Forse	1,575 0 0
Church	1,539 0 0
Bastow...	1,495 0 0
Walters, E.	1,490 0 0
Beaven (accepted)	1,390 0 0



J. F. KNIGHTS, PHOTOGRAPHER, WYNNE ROAD, BRIXTON

"PHOTO-TINT," by James Akerman, 8 Queen Square London W.C.

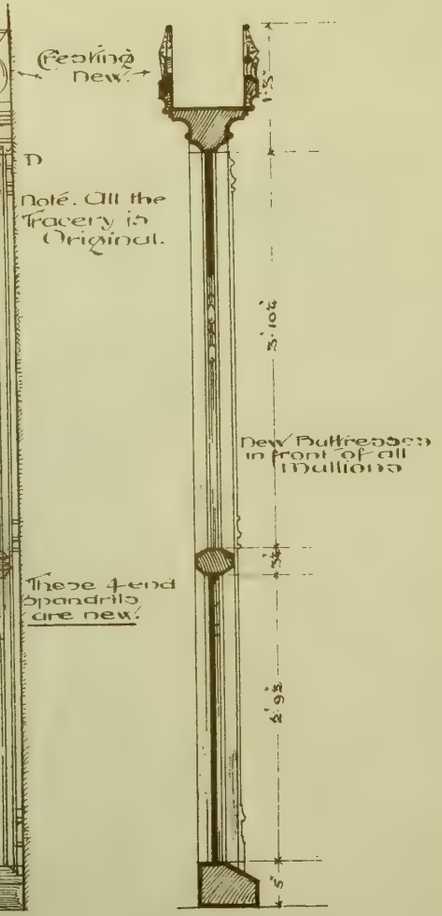
No. 5 · HYDE PARK PLACE · JOSEPH AND SMITHEM · ARCHTS

Screen in South Aisle. Wiggenhall St Mary's Church. Norfolk.

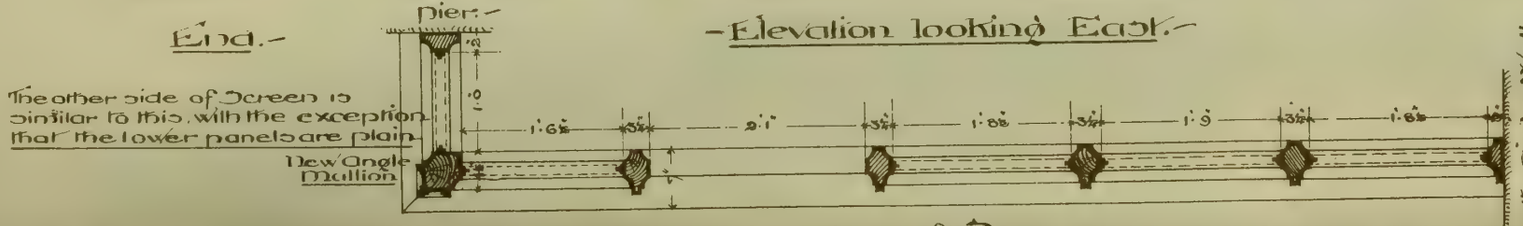


End.

Elevation looking East.

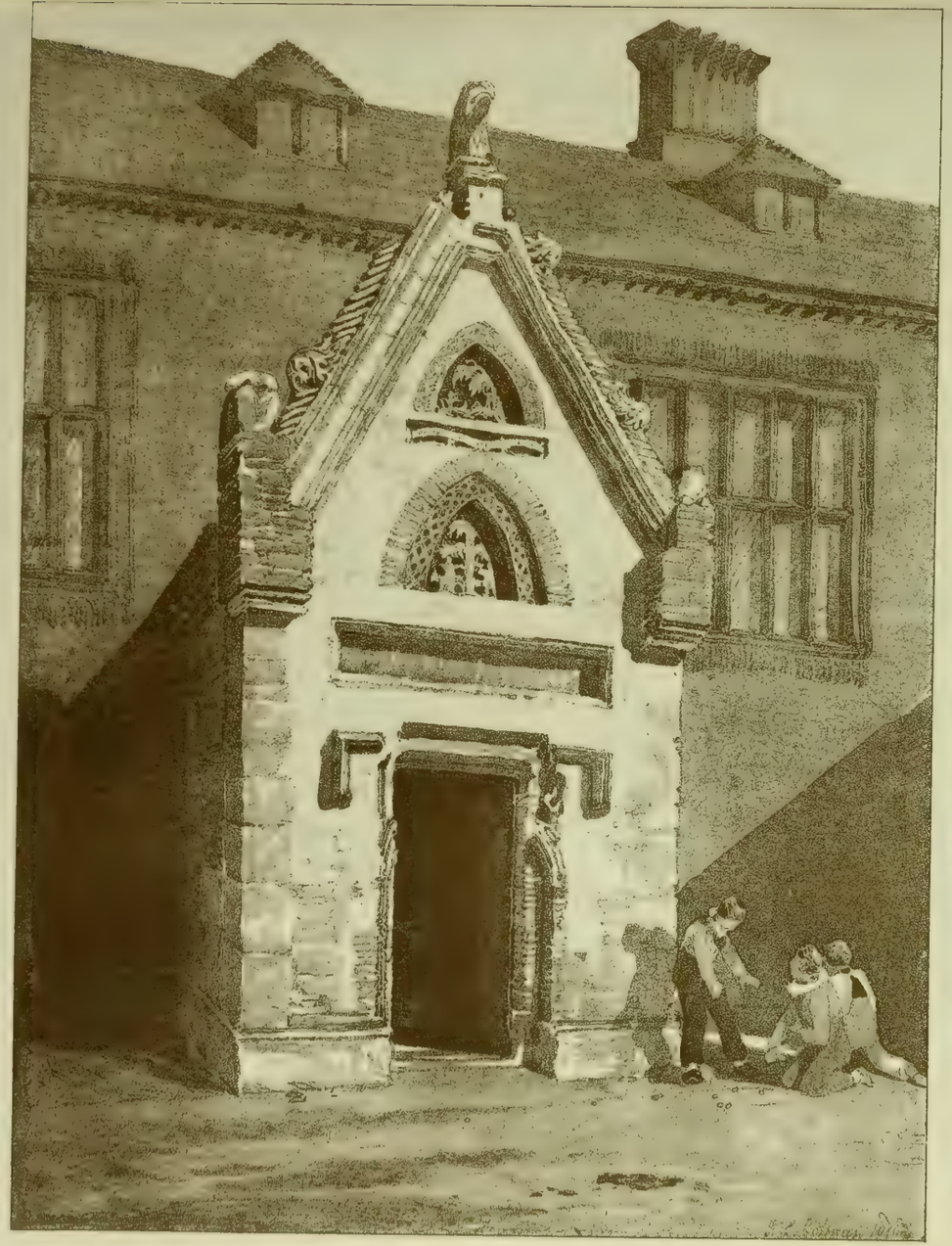


Section.



Plan of Screen.

Measured & drawn.
E. Guy Dawber.



ARCHITECTURAL ASSOCIATION EXCURSION 1889.

THE CUSTOM HOUSE, KINGS LYNN,

PHOTOGRAPHED BY PAYNE JENNINGS, AND

THE PORCH OF FREE SCHOOL THETFORD,

DRAWN BY J S COTMAN, 1818



'PHOTO-TINT' BY JAMES AKERMAN



PHOTO TINT by James Akerman, Queen Square, London, W.

THE LONDON JOINT STOCK BANK - PALL MALL - R. CREESE HARRISON, ARCHT.

Sketches from ye FENS:

Near Kings Lynn Norfolk

by A Needham Wilson



St Mary

Gedney Lincolnshire

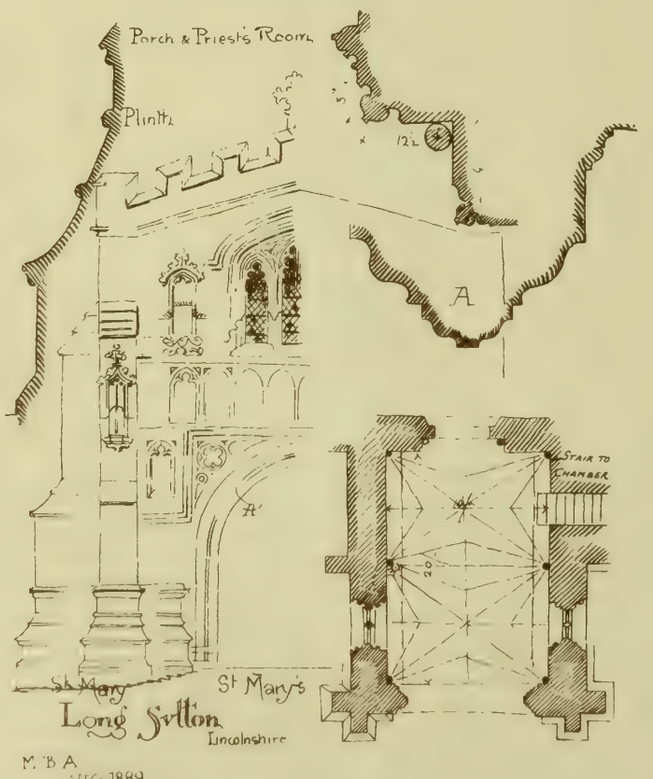
Excepting Tower & Pinnacles, Nave Roof mainly of 14th century & supposed to have been built by the abbots of Croyland. Spire said to have been 100ft high has gone. There is an ancient Copper Font of peculiar construction in Porch door with Saxon Motto.

A Needham Wilson



Walpole St

S. Pe



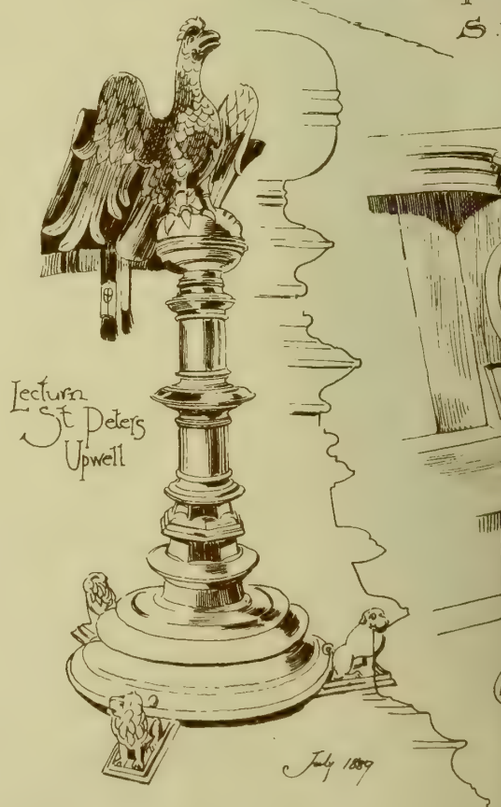
St Mary's

Long Sutton

Lincolnshire

M. B. A.

Aug 1884



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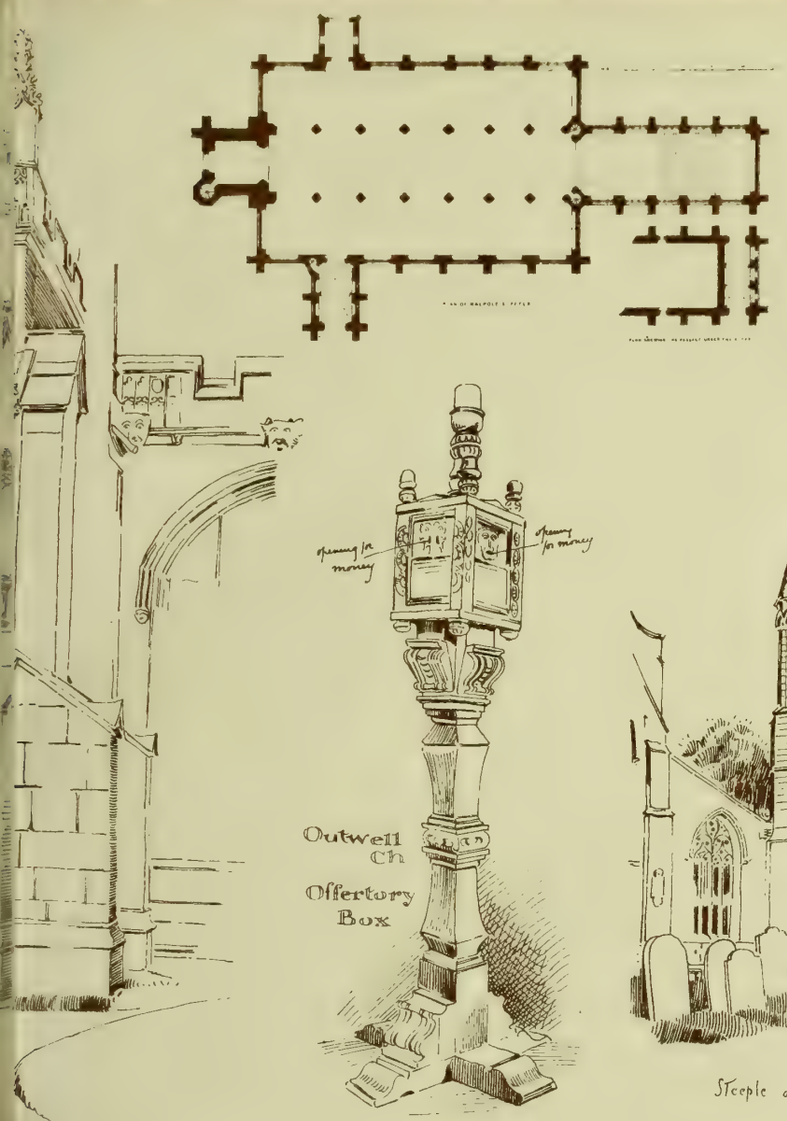
St Peters

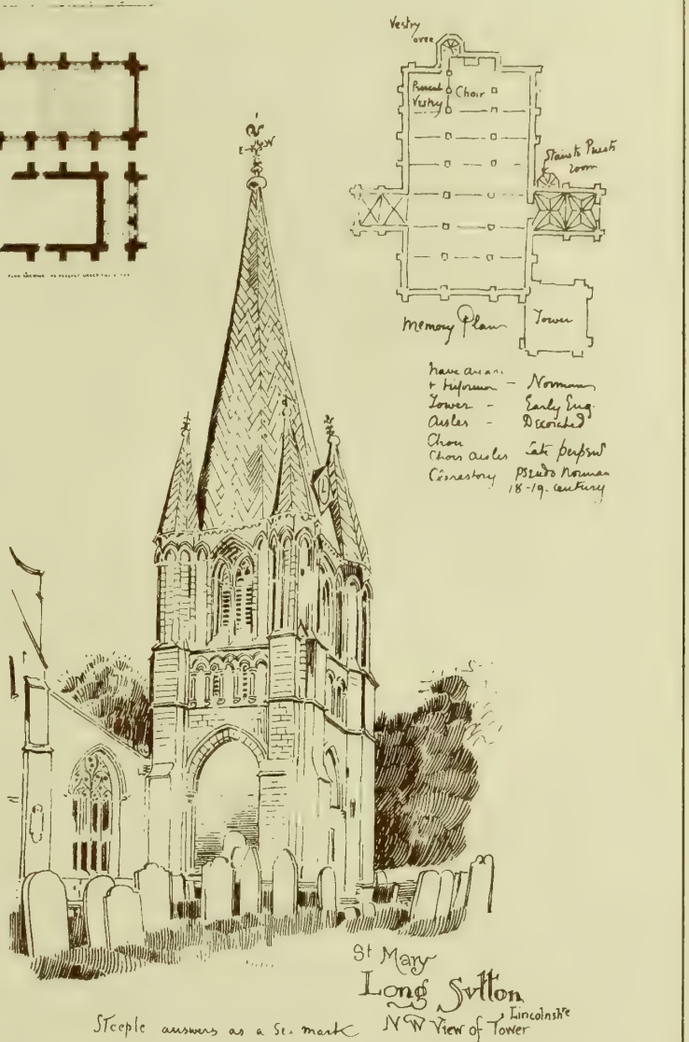
Upwell

July 1889

Chan Sea

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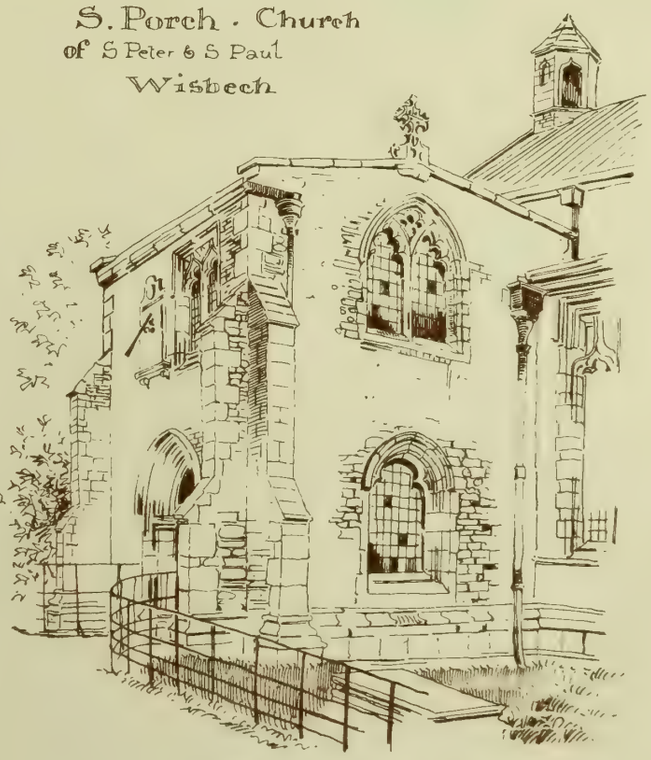




Peter

a Needham Wilson

S. Porch · Church
of S Peter & S Paul
Wisbech



2/9½

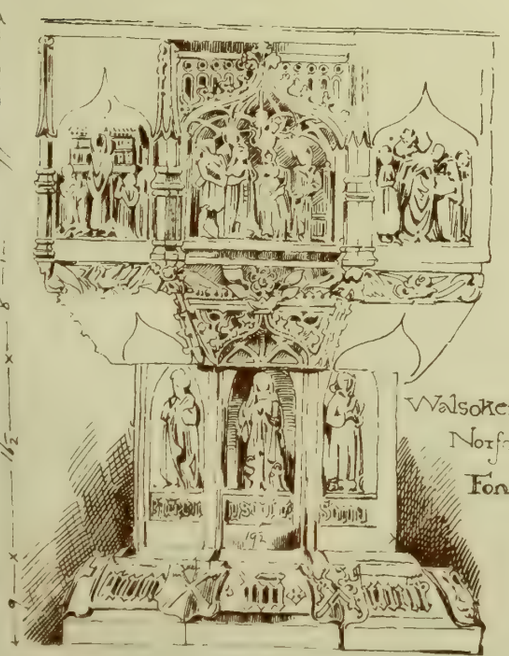
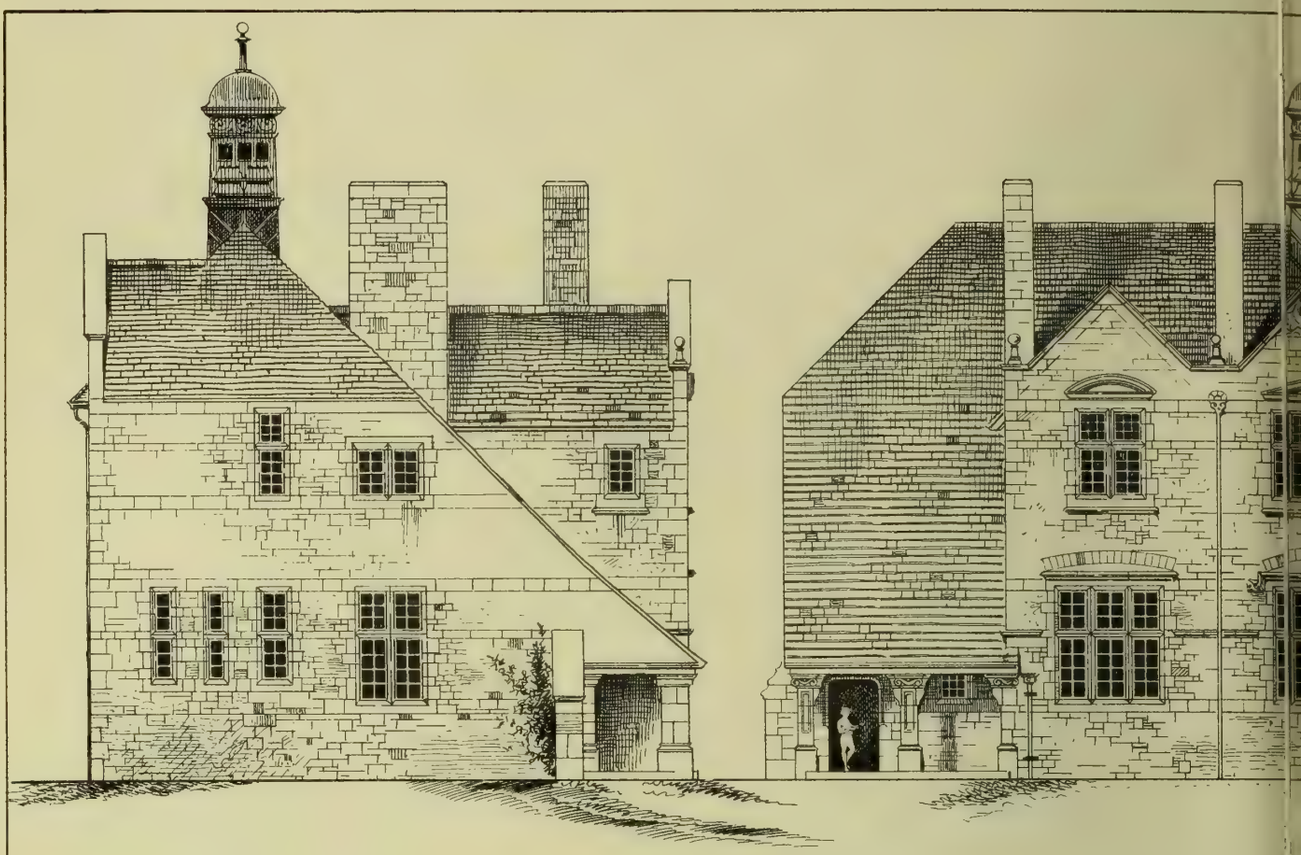


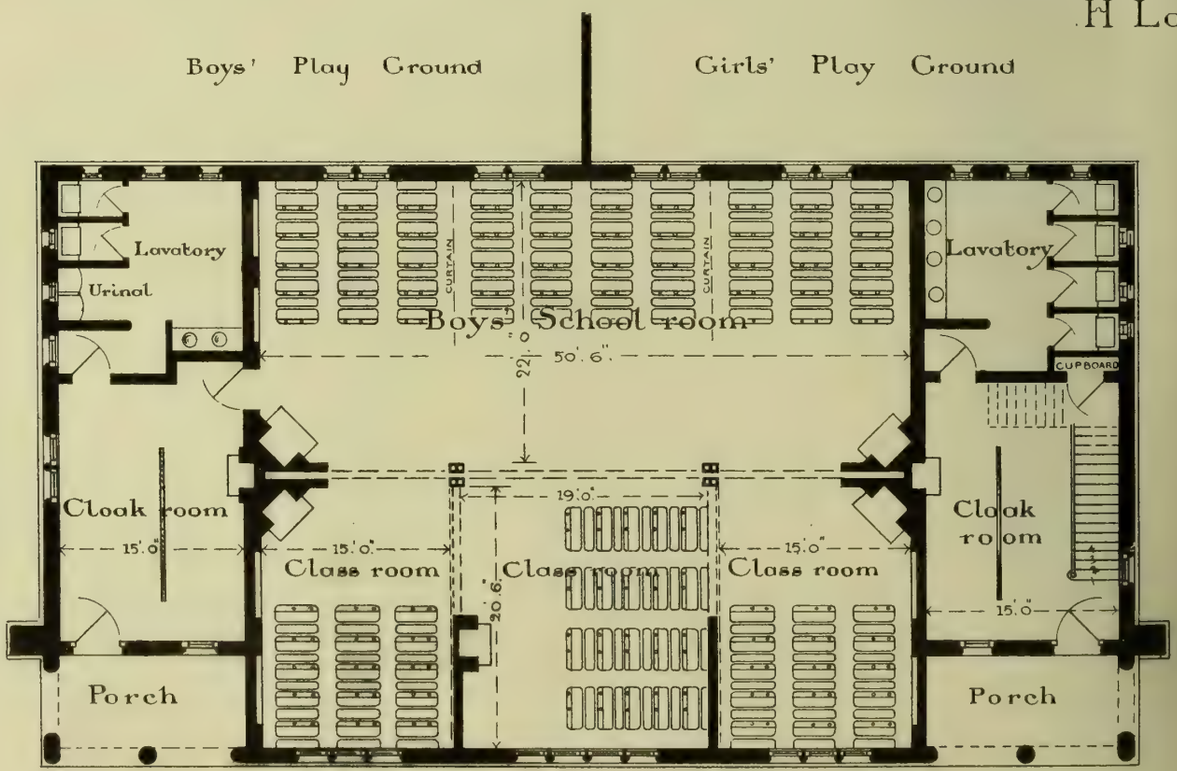
Photo-Lithographed & Printed by Vincent Brooks, Day & Son, Queen Square W.C.



End Elevation Front

PRACTICAL ARCHITECTURE WITH DETAILED

H Love

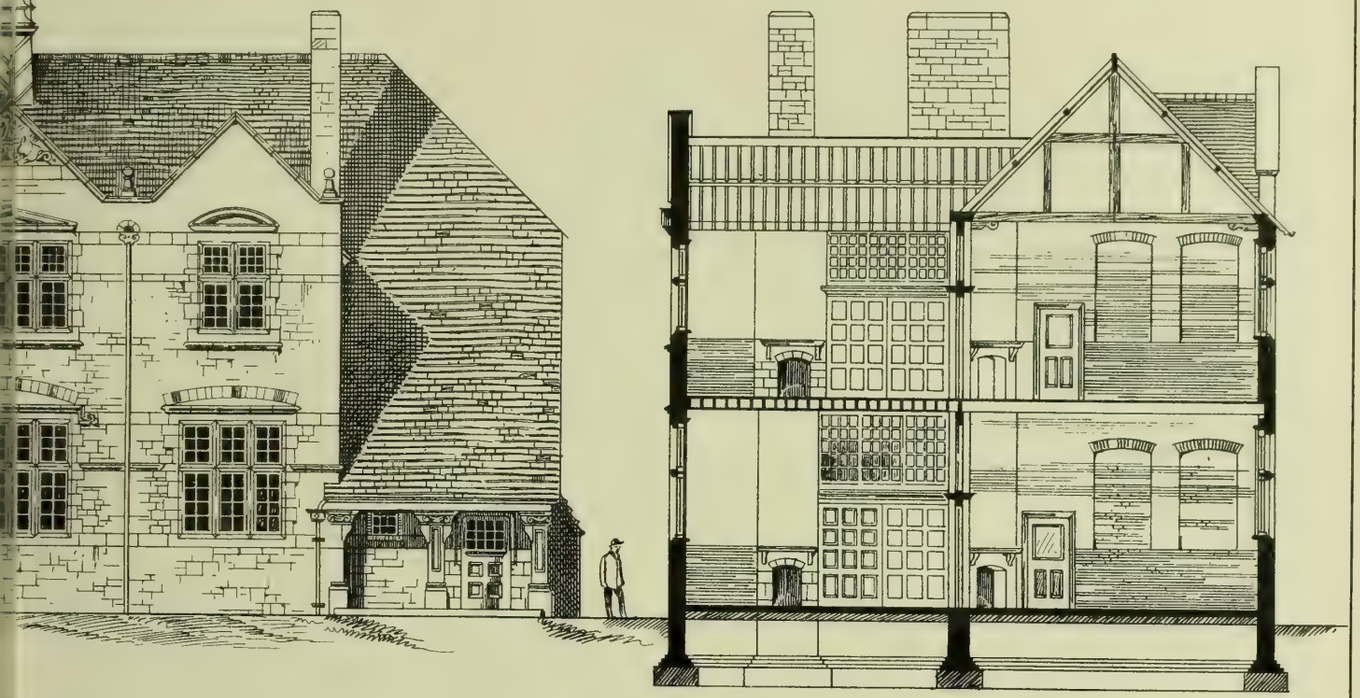


Ground Plan

Scale of

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No. 16.



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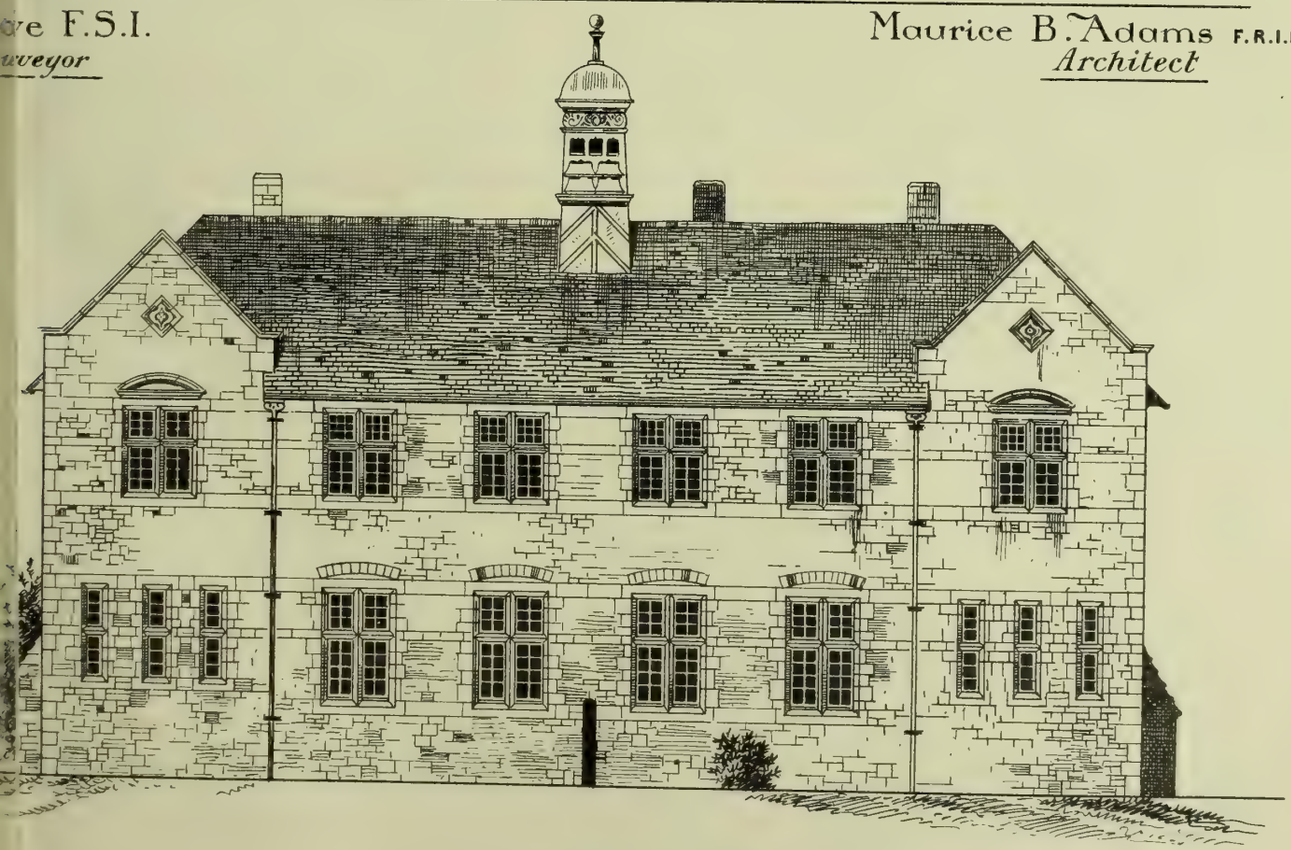
Cross Section

…IMATES

A Village Elementary School

…ve F.S.I.
…veyor

Maurice B. Adams F.R.I.B.A.
Architect



Back Elevation

…eet
50 60 70 80

Photo Lithographed & Printed by James Akerman 6 Queen Square W C

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1808.
FRIDAY, AUGUST 30, 1889.

SOLIDS AND APERTURES.

THE proportion between the solids and voids in building is one of the most capable vehicles in the hands of the skilful architect for giving character and expression to his work. Who has not noticed how austere and sullen the apertureless wall is as we see it in a fortress or a keep, with its solid masses of masonry pierced only by loopholes; and on the other hand, the cheerfulness and gaiety which are suggested by the Venetian Palace, with its open intercolumination and large windows. These are extreme instances of the impression conveyed by two opposite kinds of building. The solid wall and the arcade are simple illustrations of the opposite effects produced by solid and void. All buildings have the wall and window combined; there is solid and aperture, and it is the proportion of the one to the other of which we now speak. We can take historic examples to exemplify our meaning. The Egyptian temple at Edfou, with its massive pylons forming the gateway and its pillared courts, represents one of the severest buildings of the solid class. There was no light except over the screen walls which filled the spaces between the ponderous pillars of the colonnades, and in its sublime solidity it stands unique. The great Hypostyle Hall at Karnac is a still greater instance of massive grandeur; it, too, is only lighted through a clerestory in the centre, the flat roof of which is carried by ponderous pillars forming an avenue of granite which has, for mass, no equal, while the lateral wings of the hall are thickly studded by smaller shafts each of seven rows. We do not know whether any accurate calculation has ever been made of the area covered by pillars in this great palace hall, or the proportion they bear to the open parts of plan; there is no doubt, however, that these supports would occupy quite one-third of the whole area of the hall, as the rows of columns are placed at a distance of only one diameter from each other. If we compare this example with the area of supports found in Amiens Cathedral, which is one of the few Mediæval buildings in which the points of support are reduced to a minimum, we perceive a remarkable difference; and the airiness and lightness, in consequence, are the chief merits of its design. Our own Salisbury and Westminster are instances of large covered areas with few points of support. The plan of Cologne Cathedral affords another instance, with its double aisles covering an area of 91,464ft., or quite a fourth more than Amiens, and resembling it in many respects. These buildings illustrate extreme cases. If we take the trouble to examine the ground plans of our English cathedrals, and compare one with the other, and the effect of each, we obtain a good practical lesson of the wonderful difference in character between the earlier Norman edifices, like Durham and Norwich, and those of Early English and later date. Perhaps for grandeur of mass in pillars the nave of Winchester is unsurpassed, and exceeds, in the area occupied by its piers, that of any other edifice, and though it is of the 15th-century style, the actual piers are Norman, encased by Wykeham. Those who have entered the cathedral by the west doorway can never forget the impression of solemnity and awe made by this great vista of stone piers with its lofty and comparatively narrow nave. The eye rests on the multiplicity of shafts and pillars which surround the vast piers, as one after another they present their sides in the perspective of the nave, and till one advances a few steps up the nave the piers in their close succession resemble a vast but broken wall of stone on either side; the openings are not perceived till the spectator turns his eye right and left of him. In actual measurement the diameter of each pier nearly equals the opening; as they are set diagonally, the receding faces towards the nave are presented full view to the eye. A lighter effect is produced at Canterbury, where the diameter of pier is about doubled in the opening; while at Salisbury the proportion of opening to pier is quite 3 to 1, and these three buildings have varying effects upon us owing to the relation between solid and opening. The emotion of sublimity and awe is more powerfully awakened in Winchester than it is either at Canterbury or York, and considerably more than it is aroused at Salisbury, although in every one of the three last-named edifices we have in place of sublimity that beauty and elegance which bespeak a more scientific perception of proportion between solid and aperture, and a more advanced and intellectual style. In the naves of York and Lincoln a nicer balance of structure between the piers and the arch openings occur; the former, indeed, is wide and spacious, and rather loses something of grandeur by its very width and openness. In Wells there is a charming harmony between solid and aperture in the arcades; the piers are beautifully arranged with shafts grouped within a rectangular plan in the form of a Greek cross, which outline is retained in the form of abacus and arch mouldings. The diameter of pier is about half that of the opening. Much of the real mass of the pier is minimised to the eye by the employment of small shafts round it, which we see to perfection in St. Hugh's choir, Lincoln, and in the north transept of Westminster. In the former, the pier proper is a square set diamond-wise, with engaged shafts at each angle, and one in the centre of each side; in the latter, the pier is cylindrical, the shafts, four in number, are arranged in the lines of principal axes.

It is worth notice that considerable lightness and openness are attained when the aperture exceeds two diameters of the pier, and this quality reaches its greatest satisfactory limit when the opening attains a width of four diameters of the solid. We do not remember to have seen any authority which has treated of this important question of proportion between solid and space of our great buildings except in the most incidental manner, and then quite ignoring the essential quality which results. The number of bays, not their width, has been thought of more importance. The proportion between solid and opening, or the width of each bay in relation to the other dimensions, is precisely the element, other things being the same, which imparts to an interior its qualities of grandeur, size, or elegance, yet modern architects are pleased if they can produce a *tour de force* effect by reducing to a minimum all the solids of their interiors. The object of making a large unobstructed area for the congregation has been effected by reducing the number of piers or columns or their area to a minimum in many churches; but the experiment cannot be regarded with much approval from an architectural point of view, and it is better and more satisfactory to depart at once from the arcaded type of plan, and adopt a Greek cross or some modification of the square as the basis of the design. We can never obtain an imposing or grand effect by cutting down or "starving" the proportions of the pillars in churches, or reducing their number; but we might do so by putting the same area in the form of a Greek cross, and throwing great arches across the centre from angle to angle, making a great square crossing upon which to erect a domical vault. For we may have the grandeur and imposing effects of great vaulted spaces as we can of massive arcades, though without the charm of mystery and gloom which cling to the old traditional church, and have given it a wide and lasting influence. Somehow or other, the architects of many large Nonconformist churches, where the gathering of a large congregation is everything, have still left this problem to others, having overlooked the possibilities of the equal-armed cross, or the plans of Wren, still clinging with pertinacity to the old national type of church which has given prominence to an altar and a ritual. The feeling of sentiment is strong, and the old church nave and aisles, with their memories and associations, have made this form as dear to builders of a reformed Protestantism as to those of the Anglican Communion. But in many of these churches we find the openings six or seven times the diameter in width, and the pillars reduced to almost iron proportions.

Externally the proportion between solid and aperture is quite as strongly expressed by the buttresses and windows. As the internal bay is the distance between the piers, so in the exterior it is expressed by the space between the buttresses. Examples are not wanting. In the earlier churches the solid wall was much in excess of the openings. Taking, again, our English cathedral churches — Ely, Durham, Norwich, and Rochester are instances, though some have had Later windows introduced, as at Durham. St. Cross Church, near Winchester, affords a good example of the proportion of wall to opening. As the style advanced, the apertures became wider or more numerous, mullions enabled a wide opening to be distributed with some attempt at preserving the solidity as we find at Salisbury, where the wall is reduced in extent to mere mullions between the lancets. The introduction of bar tracery was a still farther encroachment on the solid, till we find in the Later Perpendicular period the window occupying the whole space between the buttresses, noted examples of which occur at Bath Abbey, Henry VII.'s chapel, and King's College Chapel, Cambridge. At Bath Abbey Church a very Late example, the area of the points of support in each bay is reduced to one sixth, the pillars being 5ft. in diameter, and the arch openings 15ft. or three diameters. The points of support, in fact, of the Later Gothic churches, were confined to buttresses and to internal piers, and if we measure the area occupied by these in one transverse section of the building, and take the area of one bay, including nave and aisles, we shall obtain a fraction which will pretty fairly represent the proportion between the solids or points of supports and the total area. Our object here, however, is to point out the effect of the solids to the openings externally. The projecting buttresses, by emphasising the solid, give a degree of lightness to the exterior which the plain wall fails to impart. In design for Gothic buildings, much apparent lightness is obtained by buttresses having openings between them, and the architect who has to deal with such buildings would do well to remember that a certain wall area distributed in buttresses looks lighter than when it is preserved flat between the openings, whilst a degree of solidity and mass is secured as well.

The Greek was a master in disposing the solids of his buildings. Though without openings in the cella walls, the peristyle of columns was a distribution which satisfied the most critical taste. The intercolumnar spaces thrown into deep shadow represented the voids, and, to the vision, produced that balance which was required to give impression of solidity without an undue austerity. Without the surrounding columns the windowless walls would have been intensely gloomy and depressing; but the row of lighted columns along the front and flanks of the Parthenon was at once satisfying

and pleasing. Passing to the edifices of the Italian Revival, the voids were large and predominating, and we find all those singularly pleasing arrangements of columns and intercolumns, composite arcades, fenestration, and piers, which gave such cheerful and playful variety to the palaces of Rome and Venice. Every degree of proportion between the solid and the aperture was tried, from the massive Florentine to the open arcaded façades of the Venetian building. The Vitruvian rules as to spacing columns were founded upon a discriminating perception of the proportion between solid and void, the pycnostyle, systyle, and aræostyle arrangements representing the closeness and openness of the intercolumns.

In our ordinary buildings the proportion of solid to void is an important element of character. No one can mistake the severe apertureless front of Newgate Prison: its destination is written upon it. At the other extreme of the scale we may refer to Wollaton Hall, with its wide mullioned windows; to Blenheim, both examples of buildings erected in an earlier reign for seats of the nobility, in which the wall is reduced to pilasters on the principal fronts. Our modern street architecture is still more remarkable as showing the excessive diminution of the wall, chiefly owing to the demand for light. We have façades which are nearly all window, the wall being dwindled down to mere pilasters, as in many new business premises in the City, and notably the new Tivoli Restaurant in the Strand, and the tendency to reduce the supports to the smallest area compatible with the material, is leading some architects to go beyond the safe proportion upon which all former architecture has followed. There is a limit beyond which the open or areostyle arrangement degenerates into license or frivolity. Perrault, when he invented the interval between his coupled columns in the Louvre façade, went as far as he could in imparting to the Classic rule of his day the grace of Venetian composition, and our architects might beneficially follow his moderation.

HOUSE PROPERTY AND LOCAL AUTHORITIES.

THE rapid increase of house-building in London far exceeding the demand for accommodation has given rise to several evils which local authorities have been powerless to deal with. We do not now refer to the admitted dangers of over-crowding in its various forms; but content ourselves with noting some of the inconveniences and drawbacks in the buildings themselves. A large proportion of the houses of moderate size are designed for single families. The accommodation consists of two sitting-rooms, three or four bedrooms, and the offices comprising a small kitchen and scullery. These rooms are planned for the occupation of a tenant and his family, the sanitary provisions are limited, and generally of a meagre description, barely complying with the by-laws that have been framed. The landlords are often men of small capital, and let the houses to the first comers. For a few years the class of tenants are found for whom the property was intended; but a time comes when the number of new houses draw the tenants away, the old houses fall into a state of dilapidation, and an inferior class of tenants succeed, who sublet portions of the house. We can name several estates in which the original lease or agreement was drafted with particular reference to the occupation, the tenant covenanting nor to underlet any part of the premises, not to erect sheds or poultry houses. Subsequently these conditions are relaxed, and underletting is allowed rather than that the premises should remain vacant. It is needless to say how unfair these concessions are to the leaseholders who still remain, and who comply with the terms of their agreements. For them there is no redress but to vacate the neighbourhood. The estate suffers, and a much poorer class of tenants come, who underlet the houses floor by floor. Local authorities appear to be unaware of the extent of this growing custom of turning private houses into lodging-houses, or to the serious defect of a sanitary kind which are the consequences. To cite one instance. In a three-storied house, with only closet and bedroom accommodation for one family, three families come to dwell. The cooking must be done in the small grates of the upper floors; one convenience and ashpit have to suffice for a dozen persons at the least, and the yard at the back, if divided amongst the three tenants—which it seldom is—becomes a disreputable receptacle for all kinds of lumber and waste. Then there is only one cistern for both drinking and sanitary purposes, only one staircase, and one entrance. In some localities houses are built for the purpose of sub-letting: the upper floors are provided with cooking-ranges and conveniences, though these are inadequate and under no official control. The London Building Acts do not interfere. The Legislature has framed regulations for lodging-houses; but the same rules do not apply to the thousands of small private houses which are turned into apartments, houses totally unfit in every sanitary respect for more than one family. Only the local authorities can enforce proper by-laws as to the construction and maintenance of houses that are let out in apartments. These remarks are particularly applicable to seaside resorts at the present time, where the influx of visitors induce hundreds of the tenants of private houses to let apartments during the season, however insufficiently equipped, or inefficient the sanitary provisions of the premises are. When we know of houses let with only one closet in a dark, ill-ventilated landing, having kitchens, beneath which are drains or a cesspool, drains without ventilators or disconnecting trap, we cannot be surprised of the outbreak of epidemics. This question is the more important to all local authorities of watering-places like Brighton, Margate, Ramsgate, and Bournemouth. Leaseholders are responsible mainly for allowing the underletting of such premises, though they are hardly blameable for obtaining at the end of their leaseholds the utmost they can get out of their premises if the authorities do not interfere. To put a check on this evil the authorities should be vested with powers to prevent the wholesale conversion of private dwelling-houses into lodging-houses.

IRON ARCHES.

IN determining the form of an iron arch we have not that liberty enjoyed in settling the proportions of a girder, for it must be of such contour that when fully loaded the line of thrust shall lie within its depth, and as nearly coincident as possible with its line of resistance to compressive force; otherwise bending moments of strain of considerable magnitude may be set up, and require the expenditure of much more material than is necessary when the strains are simply compressive. Under variations of load the position of the line of thrust will shift, but if the arch is designed to act perfectly under a total or maximum load, the bending stresses set up by a partial load may not cause anywhere a compression greater than that due to the total load; this, however, will require to be determined in each individual case.

In the accompanying diagram let A B be a horizontal line tangent at A to the crown of a proposed arch, A A′ being a vertical line through the centre of the arch. On the section A A′ there will be a horizontal thrust, of which the amount will depend upon the load and upon the radius of curvature of the arch at that point. If the radial force (load) be w per lineal foot, and the radius = r feet, then, calling T = thrust at crown, both w and T being taken in tons, then T = $w \times r$. If l = span and v = rise or versed sine of the arch, then $r = \frac{l^2}{8v} + \frac{v}{2}$ (by the properties of the circle).

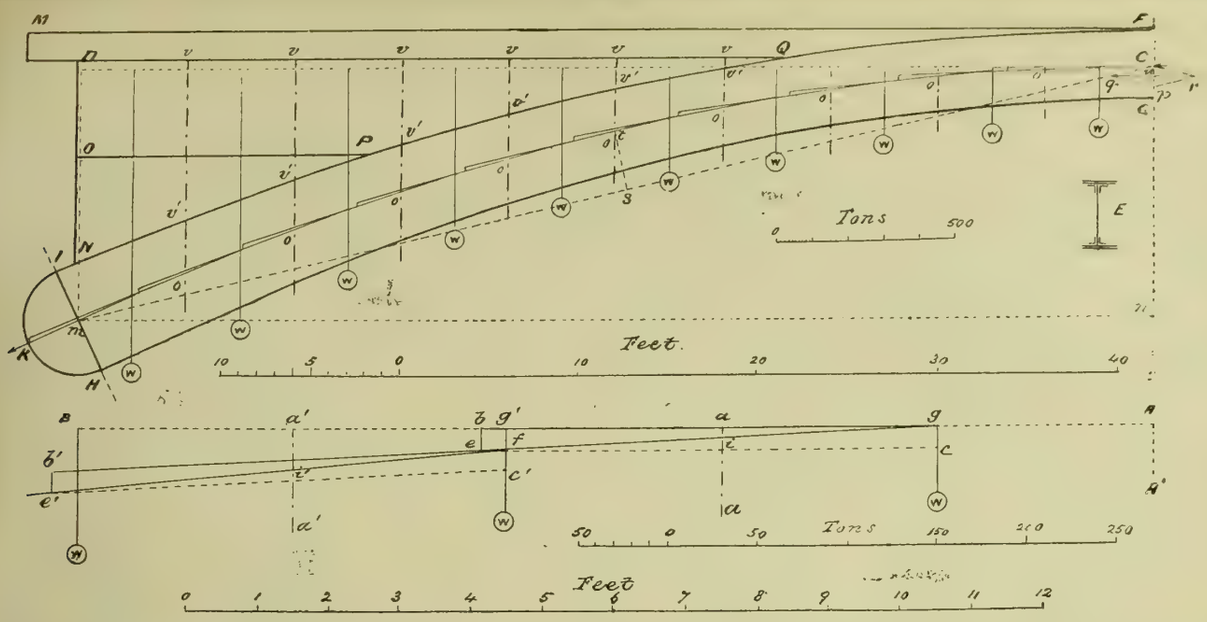
In the first place it is necessary to determine the form of the line of thrust, and thence that of the arch; for this purpose let the arch be supposed to be divided up into equal lengths equally loaded; we can then find points in the sections between which the lengths are taken, through which the line of thrust will pass. The whole weight between two sections may be considered as acting at its centre of gravity, which, in this case, will be midway between the sections, and the weight will act vertically. Let the distances between the sections be A a, a a', &c., and let these distances be bisected at g, g', &c.; draw from g, g', &c., vertical lines showing the directions in which act the loads W = w × A a.

On the line A B from the point g mark off to the scale of tons $g b$ = T, the horizontal thrust at the crown; and from g on the vertical line make $g c$ = W, and complete the parallelogram $g b e c$, and draw the resultant $g e$; then i, the point at which the resultant $g e$ intersects the section $a a$, will be a point in the line of thrust, and the resultant $g e$ will be the amount of thrust on the section $a a$. Now produce the resultant $g e$ to b'; and f being the point where $g e$ intersects the vertical line drawn from g', make $f b' = g e$, and $f c'$ = W, and complete the parallelogram $f b' e' c'$; then the point i, where the resultant $f e'$ intersects the section $a' a'$, will be another point in the line of thrust, and by proceeding in this manner until the abutment is reached the whole line of thrust for the half-arch will be indicated by the points through which it passes at the various sections, and the closer the sections are taken the more accurately will the curve be delineated.

The thrust on the section $a a$ is represented by the resultant $g e$, both in direction and amount; but $g b e$ is a right-angled triangle, for $g b$ is in the direction of the horizontal thrust at the crown, and $b e$ is parallel to $g c$ which is vertical; therefore the hypothenuse $g e = \sqrt{g b^2 + b e^2} = \sqrt{g b^2 + g c^2}$. Now $g b$ = the horizontal thrust T, and $g c$ = W = $w \times$ A a; let A a = x, and let T = the thrust on any section distant x feet from the crown of the arch, x being measured horizontally then, $T' = \sqrt{T^2 + w^2 x^2}$, which is the general expression for the thrust at any point where the lines of thrust and resistance in the arch coincide.

It will be observed that in the application of this construction it is not necessary to draw the parallelograms entirely, as each resultant ($g e$) gives the direction and length of the following component ($f b'$) in an inclined direction, and the other component ($b' e'$) is always vertical; hence it is sufficient to describe the triangles $g b e$, $f b' e'$, &c., to find the points i, i', &c., in the line of thrust. Such a line determined for half an arch uniformly loaded is shown by C K, passing through points o, o, o, &c., in sections indicated by alternate "line and dot" lines. The vertical lines drawn through the centres of gravity of the segments into which the half arch is assumed to be divided, are drawn full, and each one is marked at its lower extremity by w in a circle. The abutment line of the arch is at I H, which is drawn at right angles to a tangent to the curve of thrust at m. The round bearing I K H is used to allow of its accommodation to distortion of form due to expansion and contraction of the arched rib by changes of temperature.

We will now take an example in order to show the application of these investigations



In the diagram let F n be a vertical line drawn through the crown of the arch, and meeting in n, as horizontal line $m\,n$ drawn from m, the point of springing of the arch; draw C D parallel to $n\,m$, and m D parallel to n C, then will D C and D m be also equal to $m\,n$ and C n respectively; and $m\,n$ = half the span l, and C n equal the rise or versed sine C n.

The horizontal thrust at the centre is first to be determined, and in order to do this a radius of curvature at the crown C must be assumed, for the line of resistance is not a circular arc, but its radius increases as the abutment is approached. We may take the radius of a circular arc which would give a rise somewhat greater than the necessities of the case require, as the radius at the crown, and work from this; say, then, that the versed sine is not to be more than one-eighth of the effective span of the arch, and let the required arch have a span of 120ft., then the rise taken for calculating the radius at the crown will be $120 \div 8 = 15$ft.; and the actual rise C n, which will be found by constructing the curve of the line of thrust, will be somewhat less.

The span being 120ft., and assuming v = 15ft., then at the crown

$$r = \frac{l^2}{8 \cdot v} + \frac{v}{2} = \frac{(120)^2}{8 \times 15} + \frac{15}{2} = 127{\cdot}5\text{ft.}$$

Let w = 2 tons per lineal foot; then T = $w \times r = 2 \times 127{\cdot}5 = 255$ tons.

In the diagram the half span of the arch is divided into ten segments, so A a, $a\,a'$, &c., equal 6ft. each, and W = $w \times$ A $a = 2 \times 6 = 12$ tons. The scale to which the triangles of force on the line C m are drawn, 500 tons to the inch, is, of course, far too small for the original plotting, from which our illustration has been reduced, and the student should replot it to the larger scale, 100 tons to the inch, when by using a diagonal scale very good results can be obtained.

The curve of thrust being completed, the operation can be checked by calculating the horizontal pressure at the crown by the principle of moments. The vertical component at the point of support, and therefore its reaction, is one-half of the total load, or $\frac{w \cdot l}{2}$ and it acts at a horizontal distance of $\frac{l}{2}$ from the centre of the span; therefore its moment is $\frac{w \cdot l^2}{4}$ acting upwards; the weight of half the arch, which may be taken as acting at its centre of gravity downwards about the centre of the span is $\frac{w\,l}{2}$, and acts at a horizontal distance of $\frac{l}{4}$; therefore its moment is $\frac{w\,l^2}{8}$, and the resultant moment of pressure will therefore be $\frac{w\,l^2}{4} - \frac{w\,l^2}{8} = \frac{w\,l^2}{4}$. The resistance at C, which must be equal to T, acts at a vertical distance = C n; therefore as the moments must be equal, $\frac{w\,l^2}{8}$ = T $\times$ C n; therefore T = $\frac{w\,l^2}{8\,(\text{C}\,n)}$. C n = D m, and D m scales 14·1ft.; therefore—

$$\text{T} = \frac{w \cdot l^2}{8 \cdot (\text{C}\,n)} = \frac{2 \times (120)^2}{8 \times 14{\cdot}1} = 255{\cdot}3\text{ tons,}$$

which is almost exactly the same as that obtained before, 255 tons,

The arch is assumed to be sufficiently braced, vertically by the spandrel which would come upon it, laterally by the cross bracing; then if 4 tons per sectional square inch is allowed as safe working stress, the section at the crown will require $\frac{255}{4} = 63{\cdot}75$sq.in. The section is shown at E in the illustration. It is built up in girder form, of plates and angle irons, and is made one-thirtieth of the span in depth—that is, 4ft. between the flange plates. The quantity will be made up by one web plate, 48in. by $\frac{1}{2}$in. thick = 24sq.in., four angle irons, 3½in. by 3½in. by ½in. thick = 13sq.in., and two flange plates, 24in. by 9-16in. thick = 27sq.in., making in all 64sq.in. of sectional area. Half-way between the crown and the springing—that is to say, at 30ft. from the former, the thrust will be—

$$\text{T}^1 = \sqrt{\text{T}^2 + w \cdot x^2} = \sqrt{(255)^2 + (2 \times 30)^2} = 261{\cdot}96$$

—say, 262 tons, the corresponding sectional area for which is $\frac{262}{4} = 65{\cdot}5$sq.in. As we have drawn the outline of the arch F I H G, it becomes deeper as the springing is approached, and at 30ft. from the crown the depth is 4·6ft.; there will, therefore, be in the web $55{\cdot}2 \times \frac{1}{2} = 27{\cdot}6$sq.in., 3·6sq.in. more than at the crown, which will more than make what is required by the additional stress at the point in question.

We will now proceed to examine the effect of a concentrated load upon the arch. There will, of course, always be the dead weight of the structure itself, and this, in the present case, will be assumed as one half of the total load. There will then be only one half of the working stress on the metal, and if any bending strain comes upon the work there will be half the working strength of the section to resist it; the effect will be to relieve the compression on one flange and increase it upon the other. The moment of resistance of any section in foot-tons is = S $\times$ d, where S = the total direct resistance of one flange, and d = the depth in feet of the rib. In calculating the bending resistance of the rib, it is treated as a girder, the sectional area taken as available being that of the flange plates, and that of the horizontal limbs of the angle irons, and the working strength we have to spare is two tons per sectional square inch. The plate area is 24in. by $\frac{9}{16}$in. = 13½in., and angle iron two limbs 3½in. by ½in. thick = 3·5in., making a total of 17sq.in., of which the direct resistance will be 17 $\times$ 2 tons = 34 tons, and the moment of resistance M = 34 d. The value of d will vary with the section of the arch at which it is taken.

Now, referring again to the diagram, let there be a concentrated load at the crown of the arch acting vertically in the direction C n, and let its amount be represented by C p. This load has to be carried to the springing m and to the corresponding springing at the opposite end of the arch. Draw, therefore, the line C m to the left-hand springing, and assume a similar line drawn from C to the right-hand springing, and complete the parallelogram C $q\,p\,r$, then C q will represent the thrust passing to m, and C r that passing to the opposite springing.

Join $q\,r$, then $q\,r$ will bisect C p, which represents the load concentrated at the crown of the arch. Call this load W c. If u is the point of bisection of C p, then C u = $\frac{\text{W}\,c}{2}$. C $q\,u$ and C $m\,n$ are obviously similar triangles; therefore, as C q : C u :: C m : C n. Or, if P = the force C q acting towards m, then as P : $\frac{\text{W}\,c}{2}$ :: C m : C n. C $m\,n$ is a right-angled triangle, therefore—

$$\text{C}\,m = \sqrt{m\,n^2 + \text{C}\,n^2} = \sqrt{(60)^2 + (14{\cdot}1)^2} = 61{\cdot}63\text{ft.}$$

As the line of thrust C $s\,m$ falls without the rib F I H G, the force acting along it will cause bending moment to come upon it, and the maximum bending moment will be at s 30ft. from the crown of the arch, and the distance $s\,t$, at which the force acts about the centre of gravity of the section, is by scale 3·4ft.; therefore, the bending moment upon the rib at this section will be equal to P $\times$ 3·4. Again—

$$\text{P} = \frac{\text{W}\,c}{2} \times \frac{\text{C}\,m}{\text{C}\,n} = \frac{\text{W}\,c \times 61{\cdot}63}{2 \times 14{\cdot}1}$$

therefore, the moment of bending stress—

$$M = \frac{W c \times 61{\cdot}63}{2 \times 14{\cdot}1} \times 3{\cdot}4 = 34d = 34 \times 4{\cdot}6 = 156{\cdot}4$$

because at ℓ the cross section of the rib is 4.6ft. deep. Transposing this expression, we have—

$$W c = 156{\cdot}4 \times \frac{2 \times 14{\cdot}1}{61{\cdot}63 \times 3{\cdot}4} = 21 \text{ tons.}$$

Thus, it is found that in the most unfavourable position on the arch a concentrated load of 21 tons would be sustained without the working resistance of the material being exceeded, and the rolling load on a pair of locomotive drivers would not be more than 15 tons, and this load cannot come upon the centre of the arch without there being some other loads before and behind it.

It will not always happen that the dead load upon an arch is equally distributed, and when it is not, the form of the line of thrust will be different from that shown in the diagram. The thrust at the springing has not yet been determined; that point being 60ft. from the crown of the arch, the stress will be—

$$T = \sqrt{T^2 + w.x^2} = \sqrt{(255)^2 + (2 \times 60)^2} = 281{\cdot}82 \text{ tons.}$$

The sectional area required will be $\frac{281{\cdot}82}{4}$ = 70·45sq.in. The depth of the arch at the springing is shown 6ft., and this gives 73sq.in., so that for the matter of sectional area a smaller depth would suffice. The flanges and angle irons together give an area of 24 + 13 = 37sq.in., leaving 70·45 − 37 = 33·45sq.in. to be made up in the web, which, being ½in. thick, would require to be 66·9in., or, say 5ft. 7in. deep, to supply the net area required. There is, however, the masonry bearing to be taken into consideration, and with the bearing area as shown, 6 × 2 = 12sq.ft., there will be a pressure of 23·4 per square foot at the springing, which is quite enough for good stonework, and if the body of the abutment is brick, this load would require to be very considerably spread by means of heavy springer stones.

Where natural abutments exist there is a very great saving effected by using iron arches in preference to plate girders, as some approximate calculations will show. In the example taken, the sectional area varies from 64 to 73sq.in., and the mean sectional area would be, taking the average of ten sections, equal to 68·5sq.in. The length measured along the centre line of the arch is 125ft.; therefore, the weight of the purely structural part will be, as a yard of iron one inch square weighs 10lb., = 28,541lb. = 12·74 tons. It will be observed that as the flanges have the same sectional area throughout, and the additional area towards the abutments is obtained by increasing the depth of the web, there is no loss in reducing the plates, such as occurs to an extent of 10 per cent. in plate-girder flanges; and, therefore, for purposes of comparison no addition need be made to the above figures.

If we assume a plate girder to be made to carry the same load as the arch, and to have a depth equal to the rise of the arch, then its central section will be the same for each flange as that of the arch at the crown, and the theoretical mean area of each flange will be two thirds of the central area, and to this must be added 10 per cent. for unavoidable excess in reducing plates; the mean area of the two flanges together will therefore be (64 × 2 × ⅔) 1·1 = 93·86sq.in. The bearings for such a girder would be at least 3ft. long, therefore the total length of girder = 126ft., and the weight of the two flanges will be = 39,413lb. = 17·6 tons. The web of such a girder at the lightest would, with stiffeners, average half an inch thick, and, therefore, weigh another 16 tons; but against this we have to set the spandrel of the arch, and the road girder on the top of the spandrel.

In the diagram the outline of the road girder is shown. The top flange M F runs the whole length of the bridge, but the bottom one dies into the arch about the point marked Q, being firmly riveted to the top flange of the rib. The road girder has at each end a bearing of 3ft. upon the abutments. To this girder are connected the cross girders carrying the roadway, and it is itself supported by uprights D N and $v v'$ resting upon the main arch, and arranged as will subsequently be described. The heaviest strain that can be brought upon the road girder would be that due to a cross girder fixed midway between two verticals. Take the heaviest central load (including allowance for road covering) at 16 tons, the depth of the girder is 18in. = 1·5ft., and span = distance between the verticals = 6ft. Then, by the ordinary formula for centrally loaded plate girders, the strain on either flange at the centre of the span is—

$$S = \frac{W \cdot l}{4\,d} = \frac{16 \times 6}{4 \times 1{\cdot}5} = 16 \text{ tons,}$$

which, at 4 tons working strain per sectional square inch, will require 4sq.in. sectional area in each flange; and this will be met by making each flange of two 4in. by 4in. by ½in. angle irons, the horizontal limbs of which will give just 4sq.in. The web, to which the ends of the cross girders are riveted, should be stout, and may be made of ½in. plate.

The spandrel will be made up of angle-iron frames, the sides of which will follow the lines D Q, D N, $v v'$, and O P, and the frames will be made in squares and irregular-sided figures to fit these lines, and riveted back to back, so that the verticals and the horizontal bars along O P will be of + section when finished, and the run along the bottom of the road girder, the top of the rib, and the line D N will be of T section. The greatest load that can come on a vertical will be 16 tons, the whole load from one end of a cross girder, and this the longest vertical must be proportioned to withstand. Gordon's formula for the breaking load per square inch of sectional area on such a strut is

$$\text{B.W.} = 19 \div \left\{1 + \frac{r^2}{900}\right\},$$

and if we allow 4 as the factor of safety, the working resistance per sectional square inch becomes

$$s = 4{\cdot}75 \left\{1 + \frac{r^2}{900}\right\},$$

r = the length divided by the least width of the strut. The length of the longest strut, $v v'$—that nearest the abutment—is 9ft., and if it is built up of 3in. angle-irons placed back to back, its least width will be 6in.; then—

$$r = \frac{9}{0{\cdot}5} = 18; \text{ and } s = 4{\cdot}75 \left\{1 + \frac{(18)^2}{900}\right\}$$

$$= 3{\cdot}5 \text{ tons per sectional square inch.}$$

Then— $\frac{16}{3{\cdot}5} = 4{\cdot}57$sq.in.

It will not, however, be practically advisable to make the angle-irons less than ½in. thick; therefore the spandrels will be built up of angle-irons 3in. by 3in. by ½in. thick.

The web of the arch will also require stiffening angle-irons in pairs on each side of the web, and these may also be 3in. by 3in. by ½in. thick. If they are placed 6ft. apart there will be 80 of them, and as they must be cranked at the ends to support the edges of the flanges, they will average 7ft. in length.

The lengths of angle iron, &c., being measured up on the diagram, the weight of the spandrels, road girder, and stiffeners to arch will be found as follows:—

One spandrel.—Angle irons,	
300ft. 3in. × 3in. × ½in. at 9·17lb. =	2751lb.
Road Girder.—Angle irons,	
240ft. 4in. × 4in. × ½in. at 12·50lb. =	3000
Web-plate,	
60ft. 1ft. 6in. × ½in. at 30·00lb. =	1800
	7551
	2
Weight of two spandrels.....	15102
Stiffeners to arch.—Angle irons,	
560ft. 3in. × 3in. × ½in. at 9·17lb.	5135
	20237
	= 9 tons.

The rivet-heads forming an equal percentage in each case are omitted in this comparison. The weight of the girder is 17·6 + 16 = 33·6 tons, and that of the arch and spandrels complete is 12·74 + 9 = 21·74 tons, showing a saving in weight of iron-work of more than 35 per cent. As a slight set back to this it must be observed that the arch will cost a little more per ton, on account of the curved form of the plates. In determining upon the whole structure the difference in construction of the abutments must be taken into consideration.

As has been pointed out, the end of the girder is shown rounded to allow the bearing to accommodate itself to slight distortions of the arch due to change of temperature, and in this connection we would point out an error which has been committed in at least one bridge of magnitude in England in the means adopted to provide for such distortion. The springing is curved so as to form part of a cylinder of large radius, and the end of the arched rib is concave, having a rather larger radius, the idea being to let the arch rock upon its bearings with changes of temperature. It will be seen that in this case only a *line of bearing* is provided to take the whole thrust of the arch. The springing plates must therefore be crushed and flattened until sufficient bearing surface is found, and altogether it makes the work very sensitive to vibratory action, and with every variation of temperature the line of resistance is shifted.

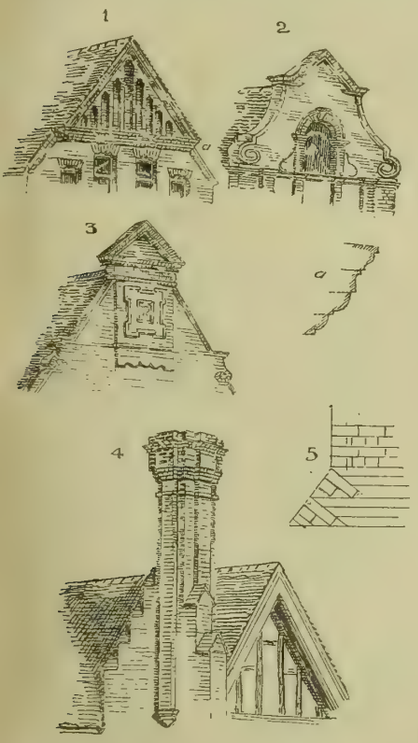
ARCHITECTURAL BRICKWORK.—XVII.

GABLE TREATMENT.

DIAPERING the surface of brickwork is one of the favourite methods employed of giving relief, and in gable-work the diaper is frequently seen, the commonest description, being an arrangement of black or blue headers, set diamond fashion. The bricks are laid as headers, and the diamonds can be set out to any practicable size by taking care to count the brick intervals on each course according to the size of the pattern. Rows or bands of this kind of ornament placed in gables, beneath eaves, or between the ranges of windows have a pleasing appearance. A simple zigzag line of dark headers is effective. The brick should be burnt dark or blue at the ends (vitrified), and never be coloured as we have seen them in buildings of an inferior kind. For gable-work it is now the fashion to use square bricks, 6in. or 9in., with flowers, or leaves, or some conventional pattern moulded on the face. These, when arranged in rows, produce a very rich effect—for example, a leaf and flower, alternately arranged in each course, so that the flowers and leaves may fall into diagonal lines, is a form of diaper often met with in Queen Anne gables. The bricks are set square, and take up two courses of the brickwork. But the simple patterns are the most effective, as the four-lobed flower or the dog-tooth pattern, which produce diamond-shaped squares when combined. Many examples will be found in Mr. James Brown's "Brick Ornament."

We have spoken of the mode of relieving surfaces by setting forward the bricks in the form of panels—a class of ornament much used in Germany, Belgium, and Holland, and in illustration of this method we give, in sketch 1, a gable treatment, which has the merit of boldness. The upper part of the gable is arcaded by setting out the bricks to form narrow piers, the whole being projected beyond the face of the wall beneath the horizontal cornice. The sketch is taken from a Board School in Lambeth. The mode of dividing the gable end by oversailing the upper portion of it is piquant, and the raking and horizontal mouldings express the internal form of the ceiling. The roof is thus made to overhang the lower half of the

gable. Sketches 2 and 3 represent two other agreeable forms of brick gables, the former showing a window opening running up into the gable, the latter a mode of treating the upper space, which has more to recommend it than the diaper. The projecting brick panel, with its pedimental termination in gauged or moulded work, very appropriately fills up the triangular space, and finishes the coping; the central panel is well suited to hold any heraldic device or coat of arms; an appropriate place also for the name and date of any public building. The break in the lines of coping by the cut scroll is not so large as to interfere with the line of roofing behind, one of the main considerations which the architect should bear in mind when he is designing an ornamental gable with cut or ramped outline. The proper method to pursue before making the design is to draw the lines of roof, and then to apportion the



ramps or "crow's steps" so that the curves or angles follow the lines of the roofing; if this is not attended to, the backs of the gables present more of the cut-cardboard style, and never look satisfactory. For this reason, long ramps and curves are to be avoided.

Our other sketches illustrate one mode of extending the base of a chimney, either for the purpose of bringing into the stack a flue or for giving a wider base to the chimney. Sketch 5 shows how this can be done by what is called in buttress and chimney building "tumbling in," or a mode of reducing a stack. It will be observed that the bricks forming the ramp are set so as to be at right angles to the slope, which is often drawn at an angle of about 60°. The bond is made to follow that below. This mode of building is frequently seen in the weatherings and brick buttresses, and it forms the strongest method of bonding the work. A more picturesque style of treating the base is to form a series of steps or gablets, as indicated on sketch 4. In this instance the stepped ramp allows the flue to be carried from some distance, and to be taken up at a desirable point; on the other side the projection makes an agreeable stop to the bargeboard of the gable. Many very picturesque examples of this kind of brick gabling or ramping in connection with chimneys may be seen in Surrey, where the stack is sometimes widened considerably on both sidee as it goes down, relieving the bareness of side walls of cottages and houses. The ramped base also greatly adds to the stability of the stack above the roof.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—LI.

By Henry Lovegrove, F.S.I., Surveyor.

A VILLAGE ELEMENTARY SCHOOL.

SPECIFICATION—(*continued*).

29. *Drains.*—The drainage system is to be carried out as shown upon the plan, give any notices required, and pay for proper connection with the main sewer.

The drains to be the best salt-glazed stoneware socket-jointed pipes laid truly straight in line and gradient, jointed in cement, and carefully tested with the water-test.

The drains to have all necessary bends and junctions, the soil-pipes to be properly connected, all rain-water pipes to have glazed stoneware yard gullies with galvanised straight bar gratings 9in. square fixed in 4in. dished and tooled York cover 18in. square for surface drainage.

30. *Inspection Chambers.*—Form the inspection chambers as shown, with Hellyer's sentinel trap, stoneware channel, and trap. The floor dished up to the open channel in Portland cement. Curbs are to be provided on the top of the wall to take iron air-tight door (Dyer's), P.C. 30s. Build the walls, as shown, with proper footings on a bed of concrete 18in. thick.

31. *Inlet.*—Bring fresh air into these chambers by means of a 3in. galvanised iron inlet-pipe carried up to a convenient point and finished with mica flap-valve inlet-box made by Hellyer. This vertical pipe to be connected to a 3in. drain-pipe brought into the chamber near the top.

32. *Generally.*—After completion of the walls, carefully level and ram the earth round the footings and walls. Stop putlog holes in walls, make good to brickwork throughout, step round after plumber, and leave the whole complete.

MASON.

33. *Description.*—All stone to be of the best quality, free from vents, sand-cracks, sand-veins, and all other defects, laid on its natural quarry bed, and to be in as large stones as can be obtained. All projections to be cased and protected, the wrought work carefully cleaned down at the completion of the works.

BOX GROUND BATH STONE.

33A. *Dressings.*—The whole of the dressings of chimney caps, quoins, bands, mullions, jambs, sills, lintels, &c., to be carefully worked in accordance with the detail drawings, and set with a fine joint, with all necessary joggles, dowels, &c.

SCOT'S GATE ASH YORK STONE.

33B. *Steps, &c.*—The steps throughout to doors and thresholds, where required, to be of Scot's Gate Ash stone rubbed, and in as long lengths as possible. All girders and bearing timbers to rest on tooled templates.

WALLER.

34. *Facings.*—The external walls throughout to be faced with Kentish Rag, coursed random rubble in stones of good colour, no rusty stones to be used, and no very large stones to be used, the facing to average 7in. thick, with proper bonders, the joints to be neatly pointed in cement.

TILER.

35. *Tiles.*—Cover the roofs with first quality strawberry Broseley nibbed tiles free from fire cracks and other defects, each tile nailed with two long zinc nails to a 4in. gauge, with proper tile and half at eaves.

36. *Verges, &c.*—The eaves-courses to be double, in cement, all cuttings to verges, valleys, &c., to be neatly executed; point all verges in cement.

37. *Valleys.*—The valleys to have tiles to the proper angle, to work in with courses of tiles set and pointed in cement.

38. *Ridges.*—All roofs to have ridges of red tile with a plain roll from Messrs. Cooper and Co., Maidenhead, Berks, set and pointed in cement, and with proper intersections. Leave roofs all perfectly clean, wind and watertight, at the completion of the works.

SLATE MASON.

39. *Urinal.*—The division to urinal to be inch planed slate, with rounded edges and quadrant corner, the backs to be similar, and all put together in oil cement. The channel to be 9 by 3, dished and perforated for brass grating bedded in same in red-lead cement.

40. *Lavatory.*—Fit up in the lavatories inch planed slate tops with rounded edges, fixed on proper bearers, and perforated for wash basins.

CARPENTER.

41. *Materials.*—The timber of carpenter's work to be the first quality fir timber from the Baltic, or from Norway, free from sap, large or loose knots, shakes, or other defects, to be well seasoned. All to be sawn die square, and to hold scantlings, specified when finished. No wood containing sap will be allowed to be used.

42. *Distances.*—No joists, rafters, or quarters to be fixed more than 12in. apart, and all to be properly trimmed for chimney breasts, hearths, &c., the trimmers and trimming joists being in all cases at least ½in. thicker than the ordinary joists adjoining.

43. *Lintels.*—All internal openings to have fir lintels 1in. in depth for every foot of opening, to be the full width of reveals, and 18in. longer than the respective openings, no lintel being of less depth than 3in.

44. *Centres.*—Provide all requisite centres, turning pieces, springers, templates, rods for setting out, and all blockings, bracketings, and firrings.

45. *Wood Bricks.*—Provide wood bricks, or plugs for fixing; also joint slips for door, and window jambs for fixing joinery.

46. *Joists.*—The joists over boys' schoolroom to be 11in. by 2½in., with four rows of 3 by 2 herring-bone strutting, and over classrooms 9 by 2½, with three rows of herring-bone strutting.

47. *Roofs.*—The roofs to be framed as shown with trusses composed of tie beams 9 by 6, principal rafters 6 by 6, straining beam or collar 6 by 6, king and queen-posts 6 by 6, purlins 7 by 4, common rafters 4½ by 2, ridge 11 by 2, the joints in the latter to be properly scarfed, and bolted with ½in. wrought bolts.

All timber and boarding exposed to view to be wrought.

The eaves to have 7 by ¾ eaves-boards, with 3 by 1½ tilters, the whole of the roof to be covered with 1¼ rough boarding in batten widths and inodorous roofing felt.

48. *Gutters.*—The gutters to be formed with inch gutter-boards on 3 by 2 bearers, to be 10in. wide in the narrowest part. Gutters and flats to be laid in lengths not exceeding 10ft. with a fall of at least 1½in. in 10ft. Drips 2½in. rebated.

JOINER.

49. *Materials.*—All the deals for joinery to be perfectly sound and well seasoned, free from sap, large, loose, or decayed knots, and other defects.

The deals for framings, door-panels, &c., to be first quality red Riga, and the oak to be of English growth.

50. *Workmanship.*—The work to be finished according to detail drawings, glued joints, feather-tongued mouldings to be carefully mitred, and all glued with the best and strongest glue.

51. *Floors.*—The floors on first floor to be 1¼in. yellow battens, ploughed and tongued with hoop-iron, and laid with splayed headings. If the floors open ⅛in. they are to be taken up and relaid. All floor boards to be stacked on the site one month after signing the contract.

52. *Block Flooring.*—The school and classroom on ground floor to be of deal blocks 3in. thick laid in Stockholm tar on 6in. concrete.

53. *Skirtings.*—The wood floors throughout to have chamfered fillet 2 by 1¼, properly fixed against walls.
54. *Windows.*—Windows throughout to be fitted with 2in. moulded casements in fir, solid rebated and beaded frames and transoms 4 by 3, oak sills 5 by 2¾, weather grooved and throated. The casements to be filled in with extra stout bars to form small squares, and to be hung with 3in. brass butts. Those below transoms to be hung at the side, and fitted with Tonk's wedge casement fastening and stay, those above transoms to be hung at bottom, and fitted with Elsley's patent opener.
55. *Linings.*—The windows to have inch linings, 1¼ window boards with rounded edge, 3in. moulded architraves.
56. *Doors.*—The entrance doors to be 2¼in. four-panel, lower panel bead flush, the upper filled in with stout sash bars in small squares, and hung with 1½ pairs 4in. wrought butts to 4 by 4 fir wrought rebated and beaded frame, 3in. architrave, 6in. mortise lock, brass furniture. The other doors, except as follows, to be 2in. three-panel doors, lower panels moulded both sides, upper fitted with beads for glass, and hung with 4in. butts to 4½ by 3 fir frames, as last, and fitted with 6in. mortise locks and good brass furniture, 3in. architraves. The w.c. doors to be inch ledged and beaded, hung with 18in. cross garnets, and fitted with Norfolk latches.

ST. ALBAN'S ABBEY.

A LETTER from Mr. Hugh Roumieu Gough appeared last week in the *Guardian*, giving the facts about St. Alban's as they have already been published in these columns. The following replies thereto are given in this week's issue:

ST. ALBAN'S CATHEDRAL.

"Sir,—You have printed a letter from an architect named Gough, who, with a number of congenial spirits, mostly anonymous and all unknown, has been writing in the same style in one of the architectural papers for above three months, obviously, and indeed avowedly, in the hope of helping Mr. Gibbs's attempt to override the faculty for restoring the whole church, which the committee gave up to me, with thanks, nearly ten years ago. Everybody by this time knows their other motive, of spite for their fraternity having lost the credit and profit of the job, through their own fault at first, and for the great benefit of the building and the nation for many centuries to come, if we are to judge from what they consider their own best works, which are condemned by ten times as many people as St. Alban's, and by several of them tumbling to pieces within thirty years of their birth, as Mr. Ellis wrote lately to you. Mr. Carpenter (architect) made Street's case worse by showing that his Constantinople church was failing from his usual course of building on his own ideas, and despising and snubbing local experience.

These people know very well that all the writing in the world will not alter a single stone that is built or building, and will soon complete the restoration of all the high parts of the cathedral, making 560ft. in length altogether. And some of them know, or can easily learn at the Royal Institute of British Architects, the fate of their impudent attempt, as the late Chancellor of the diocese called it, to influence his decision on the faculty of 1880. Therefore I have let them alone, and shall for the present, if I were otherwise disposed to write at all in their newspapers. But they have been severely raked, and their ignorance and mendacity sufficiently exposed, by two most competent amateurs, who know more of architecture in general, and St. Alban's in particular, than all these impostors together. Any one who has kept the literature about it of the last ten years could expose them much more. Their only answers to those two writers consist of calling them fools and liars, toadies and shadows of Lord Grimthorpe (I have no idea what he has to give them), and my successive builders and clerks of the works cheats for making me pay three times as much as I ought and should with the help of an 'accomplished architect'! And after abusing the west front for nine years as mine, as soon as my late clerk of the works was dead they turned round and discovered that it is too good to have been designed by me, but must have been by him, without even a pretence of evidence that he ever designed anything at all, except a dreadful brick house in the Italian style for himself to die in, as it unfortunately turned out. If I could, with truth, I would make the architects a present of the compliment that a man who had never designed anything else (for making working drawings from a given design is not designing it), all of a sudden invented a great new cathedral front, which was unanimously preferred by a Bishop and a building committee to the design of their own architect, as the Chancellor's judgement said that this was. At any rate, I had designed sundry things before, and beaten architects before with them. Grimthorpe.

"St. Alban's, August 23, 1889."

"Sir,—The thanks of all Churchmen are due to Mr. H. R. Gough for his last week's letter headed 'The Destruction of St. Alban's Abbey.' It is no exaggeration to say that the vandalism being perpetrated by Lord Grimthorpe under the name 'restoration' transcends imagination. It must be *seen* to be believed in.

"It is to be hoped that all who take an interest in the preservation of what remains of this once noble building will join in the protest which, I am glad to learn, Mr. Gough is prepared to set on foot. Henry J. Day.

"Cheshunt Vicarage, Herts, Aug. 26, 1889."

GRANSORBION.

THIS is the name of a photo-graining paper, which has been designed to effect a reduction in cost to the extent of 75 per cent. as compared with the ordinary method of graining. It is made in continuous rolls, 2ft. wide, and presents the appearance of a wooden block cut for printing purposes. The paper is prepared for a variety of woods, and in each case the pattern is made 6ft. 6in. without a repeat, so that it gives a distinct advantage over any other mechanical process, whilst it is available for either oil or distemper graining, and with much facility of manipulation. The advantage of this is manifest, as it allows the decorator to deal with any piece of work demanding urgency in a satisfactory manner. The process is exceedingly simple, so much so that it can be carried out by a man of ordinary intelligence. Four pieces of paper are cut to the size of the door panels, and another piece for the lock rail. The graining colour of half oil and half turps is mixed with the other ingredients in the usual proportion, and the door is rubbed in. Other preliminaries having been disposed of, the gransorbion is taken to the top panel and laid against it directly, as the absorbent properties of the paper are so great that wherever it touches it lifts the colour, and it is, therefore, a necessity that it should touch only the place where it is wanted. Precautions are also taken that the grain is pressed equally over every part of the surface, an essential consideration being that the paper does not move, and the operation is completed in a very limited space of time. The remaining panels are treated in the same manner.

STREET PAVINGS.

THE constant renewal of the roadways of our leading thoroughfares is a serious item in the yearly expenditure of those vestry boards who have the management, besides a great hindrance to traffic. In such a street as the Strand the interference with the traffic is sometimes so great as to cause a complete block for several minutes in the day. The Embankment has been found a source of relief to this congested thoroughfare, and might be more useful if the heavy traffic could be diverted from thoroughfares like Fleet-street and Strand into it at least during certain hours of the day. The wood-blocks, with all the care bestowed upon their preparation, wear quickly into holes and ruts; and this periodical repair tempts us again to inquire whether some material could not be found in which the valuable qualities of wood could be obtained in a cheaper material? Concrete is hard, asphalte becomes slippery; but a substance possessing the qualities of both, or of wood and asphalte in some combination, would be advantageous. Would not rows of wood blocks and asphalte or concrete be cheaper and more durable than the use of one material only? We throw out the hint, in the hope of some one being able to introduce a system of paving at once, moderate in cost, having a good foothold, and possessing durability. It seems to us that the attempt must lie in making the surface represent the cross-grain of wood composed of hard ridges running crossways to the traffic, filled in with some slightly elastic substance. Several suggestive inventions have been introduced in the form of slabs having a corrugated or indented surface, but they appear still in abeyance. If the vestries of the metropolis or the County Council would undertake a few experiments, or make trials of patents already brought out, something might be done to cheapen the cost of laying and repairing our street pavements.

A few experimental pavings in the Strand, for example, would be the best and most reliable test. The public could also then see for themselves. The general adoption of wood blocks in some form in the metropolis is a fairly good proof that this kind of roadway has survived the attacks make against it; but, as wood varies in texture and hardness, it is impossible to insure uniformity of wear, however perfect the foundation and preparation of the blocks. It would be hard to say which system that has been tried has given the best results. All that we know is that no sooner is one end of the street repaired than the other end requires taking up and relaying. The difficulty the authorities have to contend against is mainly inequality of wear—the necessity of taking up and relaying the entire road on account of a few ruts and depressions on the surface.

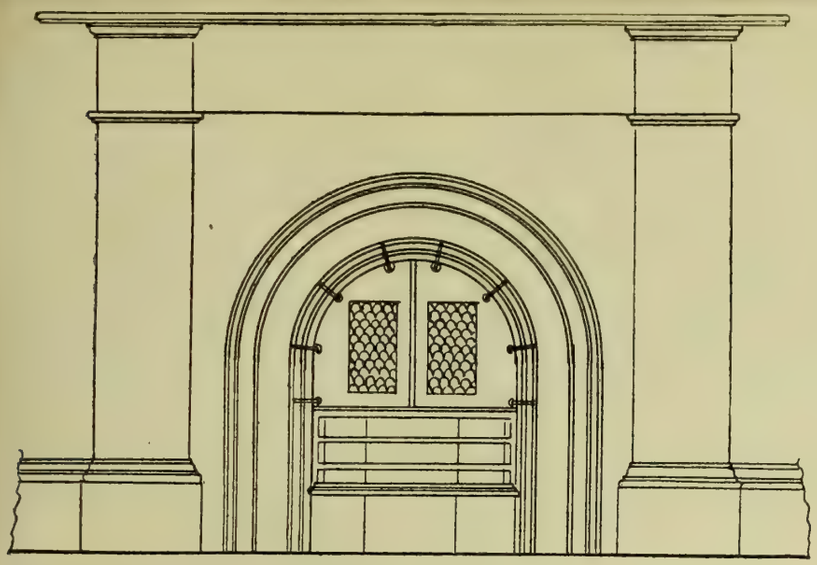
SODOM DAM RESERVOIR.

THE Sodom dam to be built on the east branch of the Croton River, for the new water supply to New York, is to consist of masonry of a height of 78ft. above the river bed, having a base of 47ft. and a total length of 500ft., the thickness at the top being 12ft. An earth dam with rubble core is also to be constructed; the thickness of the core will be 6ft., and at the top 5ft. The slopes of the embankment are 2 to 1. We still question the advisability of an earth dam with a core or heart of rubble. By the want of homogeneity between the two materials, there is a tendency to cause cracks in the earth dam, and experience has proved that disastrous results have taken place when the heart wall suddenly gives way owing to the percolation of water round it. The section shows the heart wall or core sunk in the rock and filled up at the sides with rubble, a kind of "tongue" which is absolutely necessary to give security to the rubble core. But, unless made waterproof, the water undermines the wall, and the weight of the embankment on each side has a tendency to settle, causing fissures on the upper part of the core. The Sodom masonry dam is to be composed of two stretchers and one header alternately, the latter not less than 3ft. long nor more than 7ft., the courses to rise from 30in. at bottom and 15in. at top. The face joints to be pointed in pure Portland cement.

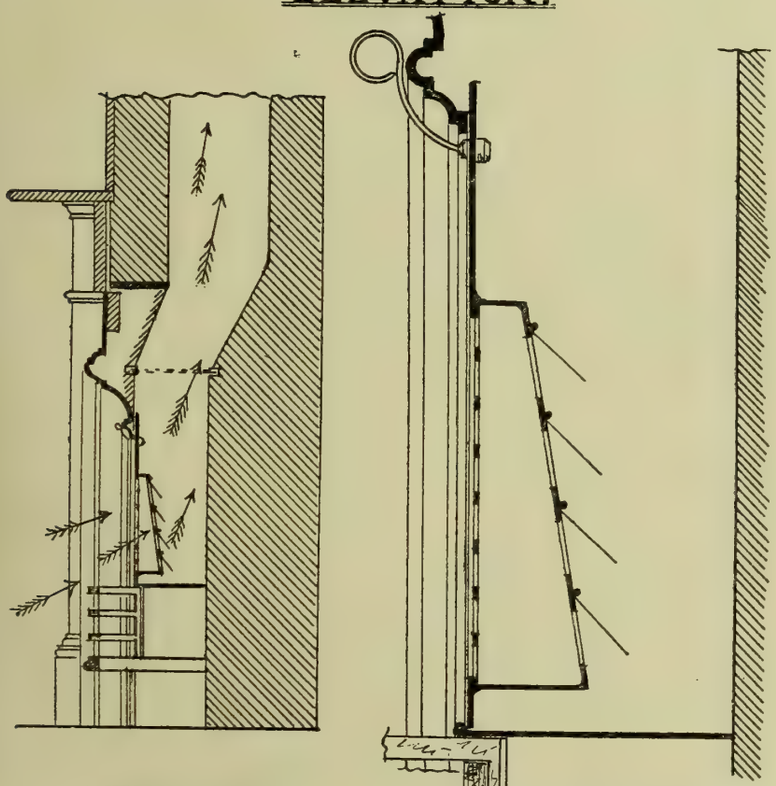
The embankments are to be laid in courses not more than 6in. thick, rolled with heavy grooved rollers and rammed by hand. The layers are watered so as to form a kind of puddle, and an extra width of 12in. is to be provided in the slopes, smoothly dressed to receive the broken stones or foundation of paving. These stones are to be set solidly on the foundation without any interstices. Two dams and two reservoirs are in progress—the Sodom dam reservoir and the Bog Brook reservoir, the capacity of which together is estimated at 9,000,000,000 gallons. A connecting tunnel, 10ft. diameter, between the reservoirs is contemplated, lined with brick and filled in over the arch with dry rock or rubble masonry.

EXTRACTION VALVES FOR GRATES.

THE accompanying drawings of back-flap extraction valves for grates may be useful to some readers, as the valves can be made and applied to almost any design for a grate, to prevent back-smoke in situations where the dampers must be closed for that purpose when fire is not used, and to allow a large quantity of air to pass from the rooms. The valves were designed about four months ago, when a few were made and placed in the front of grates to prevent any blow down and smell of back-smoke, and as a mean

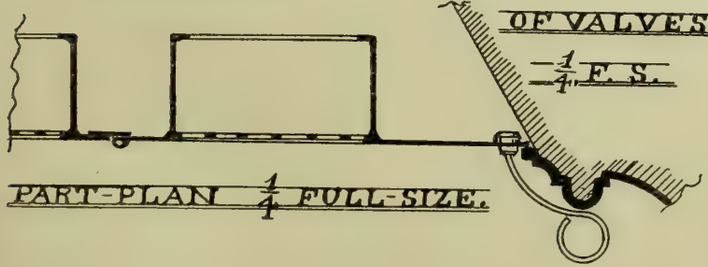


ELEVATION.



SECTION.

SECTION OF VALVES $\frac{1}{4}$ F. S.



PART-PLAN $\frac{1}{4}$ FULL-SIZE.

for the free extraction of air passing up the chimney flue.

Since the introduction of the valves there is a very marked improvement in the atmosphere of the rooms, where formerly the dampers were closed and no circulation of air in the smoke-flues. The writer has often tested the quantity of air extracted from the rooms and passing up the flues, and, without entering on a minute description of experiments, it may be sufficient to state that the quantity of air extracted by the flue and passing through the valves was equal, on an average, to the whole cubic capacity of the rooms four times per hour. The valves can be made by any tinsmith or plumber at a very moderate price.

The accompanying drawings and following description may be of service to some of your readers, if they wish to make and apply the valves.

The "elevation" shows the valve-plate fixed in the front of a very common class of grate, above the bars, and its application is further illustrated by the "section" of fireplace. The section of valves $\frac{1}{4}$ F. S. (full-size) will show the construction more distinctly—that is, on the top of the ribs is shown a plate of strong zinc, which should be carefully fitted to the sides and back of fireplace, with a bead on the front of plate.

The front plate can be made of strong zinc or brass in two pieces, jointed in the centre with an over-lap and bead as shown on "part plan, $\frac{1}{4}$ full size." A space is cut out of the front plates the size required for the perforated brass or zinc, which is soldered on the back of the front plate.



FIG. 1.

The "section of valves $\frac{1}{4}$ f. s." and "part plan $\frac{1}{4}$ full size" shows the construction of valve-frame of zinc, and the valves are made of oiled silk attached to the back of the frame with a strong wire, soldered at each end to the frame after the silk is rolled round the wire.

Fig. 1 is an elevation, and Fig. 2 a section showing a modification of the valve already described. The drawings show the front plates perforated for each valve—that is, a space $1\frac{1}{2}$in. by 4in. is cut out of the front plate for each

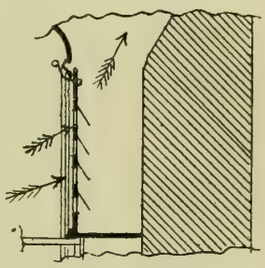


FIG. 2.

back-flap or valve of silk attached to the back of plate, as described for the $\frac{1}{4}$ full-size section.

The front plates, of either design, are firmly fixed to the grate by means of the wire catches shown on the elevations, the enlarged section, and plan. The sizes of valves shown in the drawings are found to be sufficient for rooms of about 2,000 cubic feet, where the smoke-flues are about 40ft. high.

When the room exceeds that capacity, the clear air-space of valve should be increased to about 2sq.in. to every additional 100 cubic feet of space.

W. B.

The foundation-stone of the Samuel Morley Memorial Church, Fishponds, Bristol, was laid on Thursday, the 22nd inst. The chapel, erected from the plans of Mr. Frank Wills, is to be built by Mr. H. J. Rossiter, and is in the Early Gothic style, and faced with Pennant stone, freestone being used for dressings. The portion to be now built will seat about 400 persons, with no gallery. The cost is estimated at £1,600.

The Paviors' Company offers two prizes of ten guineas and five guineas for essays on the best materials and manner for laying carriageway pavements in large cities.

The foundation-stone of a new church at Dinas, Penygraig, was laid on the 22nd inst. The church, the design of which is of a plain Gothic character, will seat 300 persons, and is being built of grey native stone, with Bath stone dressings. The contract has been let to Messrs. Turner and Sons, of Cardiff, for £1,049, which sum includes the boundary walls as a fence to half an acre of land. Mr. E. M. Bruce-Vaughan, of Cardiff, is the architect.

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ELY CATHEDRAL: VIEWS OF THE OCTAGON AND WESTERN TOWER.—LONDON AND SOUTH-WESTERN BANK, CROUCH END.—ST. GEORGE'S PARSONAGE, HALIFAX—ST. PETER'S VICARAGE, AINTREE—DINING-ROOM, TY-TO-MAEN, ST. MELLON'S—NEW ENGLISH CHURCH, LISBON.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ELY CATHEDRAL.

The annual excursion of members of the Architectural Association this year was concluded at Ely on Saturday, when Mr. W. M. Fawcett, M.A., of Cambridge, who had been with them several days, took the excursionists over the Cathedral and explained the building to the visitors. After speaking of the original foundation of the Abbey, by St. Etheldreda in the 7th century, he said that the earliest portions of the existing building are the transepts, which were begun by Abbot Simeon, the first Norman abbot, between 1082 and 1094. The work begun by him was carried on by the succeeding abbots, Bishop Hervey (the first bishop) and Bishop Reddell, who is said to have completed the nave and carried up the tower "almost to completion." The exact height is not known; but in the south transepts it was probably where a change in the work is evident by the centre shaft of each side being carried through the arch that occupies the whole space, instead of the two arches below. Bishop Reddell occupied the see 1174—1189. Bishop Eustace, between 1189 and 1215, built the galilee, which is one of the most lovely porches to be found anywhere. Bishop Hugh de Northwold, between 1229 and 1254, pulled down the Presbytery of Abbot Simeon and lengthened it considerably during his episcopate, and the beautiful work at the eastern end of the cathedral is his work. A rest in work seems to have existed after this for a season; but all the energies of the monks were called forth by the fall of Abbot Simeon's great central tower in 1321. Alan de Walsingham seems to have been a man specially gifted to meet a special emergency, and he was made the chief in carrying out the rebuilding. He avoided the old arrangement, and laid down lines at that time perfectly original in England, making a large octagon space including the aisles in the span. This work went on fairly rapidly till time for roofing came, and then he had great difficulty in obtaining timber long enough, straight enough, and strong enough for the work. He travelled many miles, and at length obtained what he wanted, and carried out his conception, the beauty of which is manifest to this present time. The three bays of the choir were also built at the same time, for the tower had fallen on them. About this time the triforium to the eastern bays was raised by the original designs of Bishop Hugh de Northwold, and is still visible only in two bays, which were left probably to throw a stronger light just where the shrine of St. Etheldreda stood. The Lady-chapel is contemporaneous with these works, and probably was under the general charge of Alan de Walsingham, as there is a boldness about it which few would dare to attempt. In the cathedral records John of Wisbech is the foreman whose name appears as having immediate direction of the work. Mr. Fawcett then mentioned how the Lady-chapel came to be used as a church, and took the party up to the lantern to see the construction which he had previously explained. After this Prior Crauden's chapel was visited, and the members were most of them obliged to catch the train and hurry home. Some, however, stayed, and sketched during the remainder of the afternoon. The Association desires to thank the dean and chapter for allowing them to roam abroad as freely as they did, and also especially to thank Canon Kirkpatrick for so kindly accompanying them. Our illustrations to-day are from the rapid pencil of Mr. John Johnson, of Queen Victoria-street, E.C., and they represent two exteriors taken from unusual points of view not before published. Previous illustrations of the cathedral and its precincts at Ely have been given in the following numbers of the BUILDING NEWS:—Plans: May 16, 1884, and Jan. 15, 1886; west front, Nov. 15, 1867; west front, photographic general view, July 13, 1888; west tower from south, with college chapel (by J. Donkin), Dec. 23, 1881; the lantern, July 10, 1863; interior of choir, looking east, Dec. 2, 1870; tympanum over south doorway (Prior's entrance), Oct. 28, 1887; bay of nave (measured by E. G. Northey), March 5, 1880; north choir aisle (J. Donkin), Dec. 22, 1882; wall arcading, Lady-chapel (Pugin Trav. Studentship drawings by Leonard Stokes), March 19 and April 2, 1880; Prior Crauden's chapel (Pugin Trav. Studentship drawings by W. H. Bidlake), March 6, 1885; altar cross, Aug. 12, 1887; the Prior's Door, March 1, 1889; and two general interior views of the choir crossing and lantern, Aug. 9, 1889.

BANK AT CROUCH END.

We give a plan and perspective sketch of a bank in course of erection at Crouch End in the Broadway at corner of Weston Park. It is being built of Portland stone and red brick, with pitch-pine fittings. In the basement are the strong rooms and lavatories, and above the bank are dwelling rooms for the manager, with a private entrance from Weston Park. The architect is Mr. George Truefitt, of 5, Bloomsbury-square, and Messrs. Lobb and Olver are the contractors. The building is for a branch of the London and South-Western Bank, Limited.

ST. GEORGE'S PARSONAGE, HALIFAX, AND ST. PETER'S VICARAGE, AINTREE.

The plans and elevations sufficiently explain these illustrations. Messrs. Bell and Roper are the architects of each house.

TY-TO-MAEN, ST. MELLON'S.

The illustration of this house, the residence of Mr. Richard Allen, is a view of the dining-room. The building was described in our issue of January 11, 1887, where we gave a view of the hall. The sentence printed over the fireplace is an old Welsh saying, and translated is, "Of every place under heaven home is the best." Mr. Bruce Vaughan, of Cardiff, was the architect, and Mr. William Clarke, of Llandaff, has executed the whole of the carving.

NEW ENGLISH CHURCH OF ST. GEORGE, LISBON.

The former church was entirely destroyed by fire in 1886, with the exception of the walls of nave, 4ft. in thickness, which have been retained in the present design, new wall arcading and double light traceried windows taking the place of the original plain square windows. The design for the rebuilding of the church was supplied by Messrs. Medland and Powell, and the building was consecrated by the Bishop of Gibraltar, the diocesan, on the 17th of March last. The stone employed in the building is a very hard description of limestone found near Cintra, and nearly all the marbles came from quarries in the same neighbourhood. The arrangement of plan is shown in our illustration. The west front is formed by tiers of arcading, the arches to porches being open, with coupled columns. The carving of the capitals of the west front and all others throughout the building has been carried out after the best examples from Alcobaça and elsewhere. The font in baptistery at west end is of varied local marbles, the pulpit being of the same character. A low pierced marble screen divides the chancel from the nave, and all the steps from the nave to the altar are of red lias. The arcading at east end of church is composed of the choicest varieties of marble. The roofs are of pitch-pine. Several of the windows, including the large wheel window above the baptistery roof, have been filled with stained glass, the work of Messrs. Lavers and Westlake. The embroidered altar-cloth was made by the East Grinstead School of Embroidery in London. The whole of the building was executed by native workmen, with foremen of the different trades under the direction of Mr. Head as clerk of works, and the committee, many of the working details having been made on the spot by the architects.

CORRUGATED IRON ROOFS.

CORRUGATED iron is now used for a great variety of purposes. The additional strength and rigidity gained by the corrugating process is considerable. In roofing, the sheets so treated can bear the weight of a man, and the saving effected in purlins and timber framing is great. The principle of corrugation has been successfully applied to bridges and floors, iron sheets bent in large corrugations sustaining considerable weights. The upper hollows are filled with concrete, which makes a solid flooring. Why this composite construction is not more used for roofing we cannot say, unless that the old-fashioned slated or tiled roof holds its own so tenaciously. If the hollows of the ordinary corrugated iron sheets were filled with concrete, and then asphalted, a strong and durable roof might be made very suitable for warehouses, farm buildings, and even houses. Exposed galvanised iron looks poor and ill-adapted for permanent buildings, besides having other disadvantages. The smoke of coal and coke fires is injurious to the zinc coating, and damp atmospheres, impregnated with smoke, soon find out weak points in the metal. Underneath, if there is no ceiling, a galvanised-iron covered building suffers from condensation of moisture, and also from extremes of heat and cold, and these defects forbid its being used for domestic dwellings. The question is whether these drawbacks cannot be obviated by imbedding the corrugated sheets in a covering of non-conducting materials so as to prevent its rapid deterioration by the atmosphere, and also the inconveniences of changes of temperature. The ordinary galvanised-iron roof cannot be painted with lead paints, though Portland cement and gas-tar have been found to be a good protection. These considerations lead to the conclusion that a covering of asphalte on cement concrete would produce a roof of considerable strength and durability.

The quality of the zinc coating would be immaterial if the metal surface was covered, and the damage done by cutting and drilling holes in the exposed sheets, thus exposing them to oxidation, would be avoided. Cheapness has too often been the only recommendation in the employment of galvanised-iron roofs; the sheets are thin and poorly coated, they are seldom painted with oxide of iron paint at the time of their erection, and the injury done by cutting and punching holes in the sheets is the cause of their speedy destruction. Perfectly galvanised sheets should be smooth and bright, showing the crystallisation, and be quite free from dark spots and cracks—physical signs that are wanting in the thin, badly galvanised sheets which find their way on roofs of the ordinary kind.

The new offices of the Manchester School Board in Deansgate will be formally opened by the chairman of the Board, Mr. Herbert Birley, on Monday, the 23rd September. They have been built from designs by Messrs. Royle and Bennett, of Manchester, selected in competition, and were illustrated in our issue of Jan. 27, 1888. The building is Free Renaissance in style, and is faced with Runcorn stone on the ground story, and the floors above with red brick, terracotta being used for dressings.

The new district church of St. John the Evangelist at Barmouth, of which Princess Beatrice laid the foundation stone on Tuesday, is being built from designs by Messrs. Douglas and Fordham, of Chester, on a site scooped out of the side of a hill, and facing the sea. It will consist of nave and side aisles, choir and chancel, with morning chapel on north, and vestries, with organ chamber above, on south of choir. Over the choir is the tower, 100ft. in height, and 34ft. square. It will be seated for 1,000 persons. The greater portion of the cost is being met by Mrs. Perrin and family, of Worcester, who have contributed the sum of £14,000, besides the oak seating and other special gifts. Mr. William Winnard, of Wigan, is the contractor, and Mr. Allen Lloyd the clerk of works.

WAYSIDE NOTES.

ONE would require to be of a very optimistic disposition to express entire satisfaction with the Government's Technical Instruction Bill. The utmost that the most enthusiastic of those competent to express an opinion will be able to say will be to declare with Sir Henry Roscoe, that "half a loaf is better than no bread." And while disgusted with the attempt of certain Members of Parliament to obstruct, with an ultimate aim of getting technical education tacked on to the "skirts" to which I alluded last week, one may yet regret that the Government should exhibit such haste to pass a measure which in the future will deeply affect the interests of the country. Remembering, however, the lethargic manner in which Parliamentary business is usually conducted, it is refreshing to find something like despatch exhibited at St. Stephen's. It is unfortunate that it happens in this case to have been exhibited in connection with a matter which, as I have said before, requires much further consideration before any permanent decision is made. Not that the lines of the present Bill will prove the worst that could have been arranged under the circumstances. It is something to get the subject disentangled from elementary education. For my part, I was much relieved to find that the measure brought forward by Sir Hart Dyke was severed by any hampering relations with the Education Department. The School Board has all its work cut out in "teaching the young idea how to shoot" properly. Secondary education bears no relation to the three R.'s and concomitant elementary studies. To keep Young England under the thumb of the members of the School Board for both primary and secondary education, would be equivalent to detaining boys at a dame's school after their arrival at an estate when reason demands that they should be removed to sterner rule.

The haste evidenced in attempting to bring into existence a system of technical education for this country points to something in the nature of a *panic*. The truth seems to be that after Englishmen awoke to the necessity for instituting some means of supplying this education, they, seeing the start gained in this matter by other countries, in a sense *lost their heads*. We are in a frenzied haste to arrange something, somehow. No less than four Bills having for their object the promotion of technical education, have been put before Parliament in the space of a few months. As it fortunately happens, Sir Hart Dyke's Bill, if not as perfect as might be, has yet been prepared in such a manner as to be vastly ahead of any of the many schemes that have heretofore been brought forward. It has been moulded in a fashion that should admit of its future development and improvement. It has been launched as an independent venture: this is a great point. It has been arranged on lines that harmonise with previous attempts to supply technical instruction. It is in harmony with the results of experiences gained from an observation of Continental systems. Every city and town will have a direct interest in arranging its own schools. Local industries will be able to be especially studied as they should be; and a cut-and-dried curriculum, which would be the chief evil that would result from placing the technical schools under the authority of the School Board, will be avoided. Considering all these advantages, we should recognise in the present Bill an effort in the right direction, and one deserving of the support of all those who think upon the subject. Had there been any chance of holding a further commission of inquiry upon technical instruction, it would have been well for the future of secondary education; but as no one having any position of influence or authority seems to consider this necessary, there is no course left but to welcome the present measure and abide by any imperfections it may contain.

The building of public baths is decidedly brisk just at present, and new projects for baths in various parts of the metropolis lead one to expect before long we shall hear of some good competitions for these structures. It is now proposed to provide baths and washhouses for the Bow district in the East of London. An inquiry was held last week at the instigation of the Local Government Board as to the plans for making this provision. From the report of the proceedings, it appears that the Vestry of Bow desire to borrow the sum of £4,000 with which to buy up the old premises of the Liberal Club in the Roman-road, and upon the site thus acquired to erect the necessary bath-houses. In the course of the Local Government Board inquiry, the barrister retained to state the facts of the case for the bath commissioners threw a good deal of light upon the financial result of adopting the Public Baths and Washhouses Act, and showed that many establishments had not only repaid their original cost, but had applied their receipts to the relief of local rates. This all goes to prove what I have often urged—viz., that if the value of baths and bathing was properly appreciated in this country, there would be a large amount of work for the architectural profession that at present we do not get. That there is, however, a marked increase in activity in this direction is further shown by the action of the Islington Vestry, who have decided to adopt the Public Baths and Washhouses Act, and borrow £50,000 wherewith to erect three separate establishments in their parish. Furthermore, I have noted the increased frequency with which reports have been made of the commencement or completion of public baths in various parts of the country.

It is to corporation baths, as distinct from buildings erected under the Public Baths and Washhouses Act, that I should be inclined to look for a large future. It ought to be a disgrace to even a moderate-sized town not to have its public baths, wherein accommodation is provided for the bathing of all classes. The aphorism "Cleanliness is next to godliness" has been little observed in this country, judging by the lamentable lack of public baths; otherwise the number of public bathing establishments would be second only to the number of Houses of God. True *hydrophobia*, however, is a rampant disease even in this enlightened land, and the remedy can only develop of its own accord—the taste for, or rather an awakening to the necessity for, regular bathing will only come slowly. Some day we will hope competition advertisements for bath-houses worthy of the country will appear in the pages of professional journals as frequently as those for any other class of building. The £50,000 of the Islington Vestry is encouraging in its way. Competing architects, returning from their well-earned holidays, may look out for some bath competitions, and fill up spare time till the inevitable rush for technical schools absorbs their whole attention. And this reminds me that some time back I gave what I averred was a *verb. sap.* to young competitors with regard to the study of technical school planning. Forewarned should be forearmed, and if the Government pass a Technical Instruction Bill those who took the advice tendered will have reason to be glad.

Typhoid fever *will*, apparently, break out with all our endeavours to be rid of its presence. Like the mythical monster of classical romance, no sooner is it got under at one place than it bursts forth in another. It is not a little remarkable that typhoid will appear in a fashionable quarter, or in a gentleman's mansion, where it skips what what one would consider a veritable plague-spot, and passes over the dens of a London slum. Much of this apparently mysterious behaviour of the undesirable visitor may, perhaps, be accounted for by the fact that where the poor suffer no one heeds, while when the weathy are scourged an outcry takes place. At times, however, it must be accredited to another cause, and that is the elaboration of sanitary fittings in the mansion. Instances innumerable will occur to all where the very precautions taken in an elaborate system of drainage have been fatal in their results. How many, many buildings are there at the present moment where sewer-gas is pouring into the house through some trap which, being placed in a position where water is seldom thrown, is a veritable ventilator, only that it lets the foul gas in instead of taking it out! How many homes are there in existence where death lurks about a dry trap in the dark recesses of the cellar! In a humble home these extra appliances would not have been provided, and its inmates are secure from the attack of fever. The evil becomes increasingly marked in grandiose buildings for the very wealthy, where conveniences of all sorts are multiplied indefinitely, with the consequence that not a half of them are used, and safeguards of all kinds are defeated when the traps, &c., get dry. I do not mean to intimate that the existence of fever at the present time in the West-end of London is to be accounted for in this way: other causes seem here at work. But the juxtaposition of *Mayfair* and *typhoid fever* cannot but cause many to reflect, and, as I have said, call to mind the frequency with which the well-to-do are visited with pestilence where the poor escape. The moral to be learned from the Mayfair outbreak—or, as some would say, the *supposed* Mayfair outbreak—is, possibly, "Look to your cesspits," or "Don't have cesspools"—excepting on a chalk subsoil in a country district, where the system is the best that can be adopted. The moral of the association of *Mayfair* and *typhoid fever*, however, looking at the incident in a broad aspect, is to be simple in sanitary work, even where the building is otherwise elaborate to a degree. "In all things the extreme excellence is simplicity."

There are several kinds of simplicity, however, which are false and spurious. There is the midden in the back-yard, which is not true simplicity, and there was the simple arrangement of Mr. Buggins, who, in driving a trench for his house-drains, unearthed a hollow tree-stump, into which he straightway turned his pipes, and considered his duty done. If I mistake not, this performance of his figures in "Dangers to Health." True simplicity starts with a conviction that no trouble, pains, and expense must be spared to attain the object desired. With this explanation, I trust my sanitary engineering friends will not think I am advocating a return to the mode of disposing of sewage in fashion in the Celestial Empire. It is difficult to explain the import of the term "true simplicity" to those who do not feel its exact meaning. One thing about the simplicity that may be taken as certain is that it is only attained by constant effort in the right direction. We labour through a lifetime from complication to simplicity, and this applies to all walks of life. We have already advanced in sanitary science; but still further improvement is necessary. The one danger that menaces the subject is *complication*, and to get rid of this possible stigma should be the aim of all those who have sanitary reform at heart.

GOTH.

CHIPS.

We learn that Mr. J. C. Edwards, of the Terracotta Works, Ruabon, received the Royal command to submit examples of his various manufactures to the Queen during her stay in North Wales. Her Majesty expressed her high approval of them, and was graciously pleased to accept a terracotta bust and a few art tiles.

The new board schools, St. Andrew's, are warmed and ventilated throughout by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester.

The St. Alban's Archæological and Architectural Society recently visited St. Mary's Church, Luton, when an interesting historical paper was read by Mr. S. Flint Clarkson, who pointed out the dates of the various portions, and eulogised the mode in which the building was restored in 1866 by the late Mr. G. E. Street.

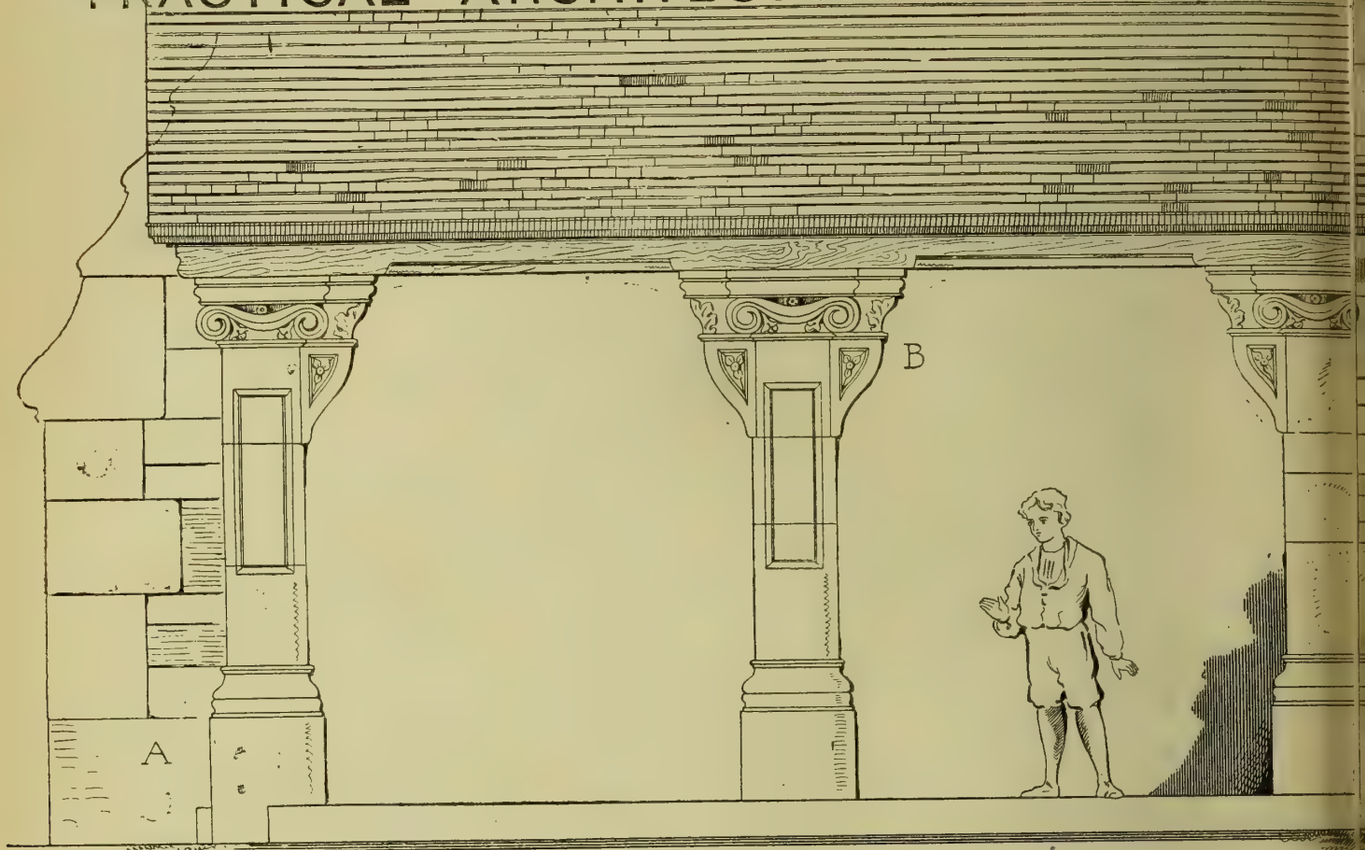
Extensive works of enlargement are contemplated at St. Paul's Church, Hyson-green, Nottingham, including the extension of the nave and the pulling down and rebuilding of chancel. Mr. G. S. Doughty, of Fletcher-gate, Nottingham, is the architect.

A pier 100ft. in length is being constructed in the bay of Babbacombe, near Torquay, and will be completed a fortnight hence. Mr. F. Matthews is the contractor, and the cost is about £1,800.

At a special meeting of the committee of the York School of Art, Mr. G. F. Jones, architect, of that city, was appointed to the secretaryship, vacant by the resignation of Mr. Wm. Monkhouse.

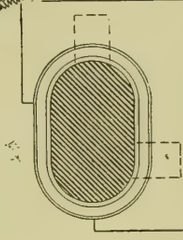
At a meeting of subscribers to the testimonial, held last week at the Town Hall, Brighton, Mr. P. C. Lockwood, who for over 30 years held the post of borough surveyor, was presented with an illuminated address and purse containing a cheque for £425. The Mayor presided, and, in making the presentation, briefly reviewed the progress made by the town of Brighton during the years Mr. Lockwood was its borough surveyor. He alluded to the carrying out of the drainage of Brighton, and the making of the esplanades, with which Mr. Lockwood had so much to do, and also to the valuable advice which he gave on the question of groyning and the protection of the foreshore. Mr. Lockwood replied at some length. Mr. P. C. Lockwood was elected town surveyor of Brighton in 1858, out of 72 applicants.

PRACTICAL ARCHITECTURE WITH DETAIL

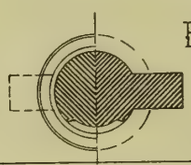


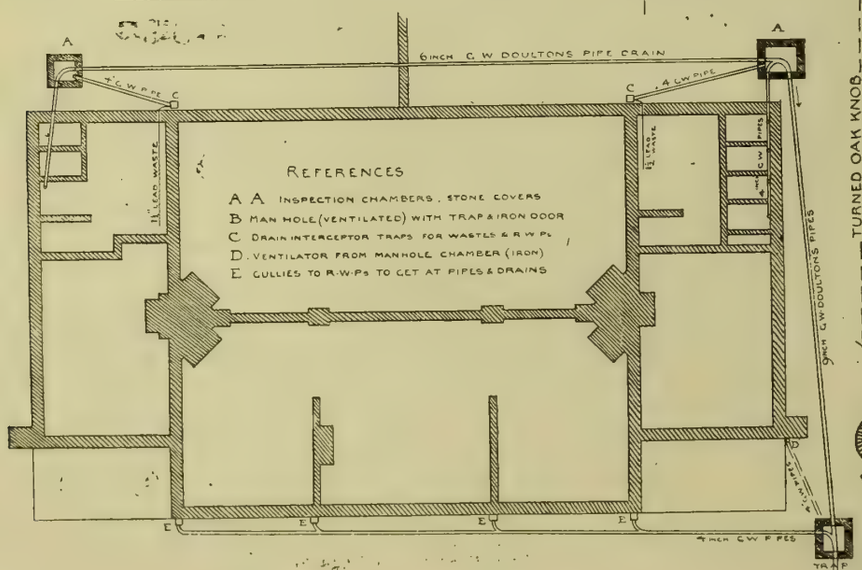
ENTRANCE PORCHES

PLAN A



PLAN B





TURNED OAK KNOB

PLAN OF DRAINAGE &c

SCALE OF FEET

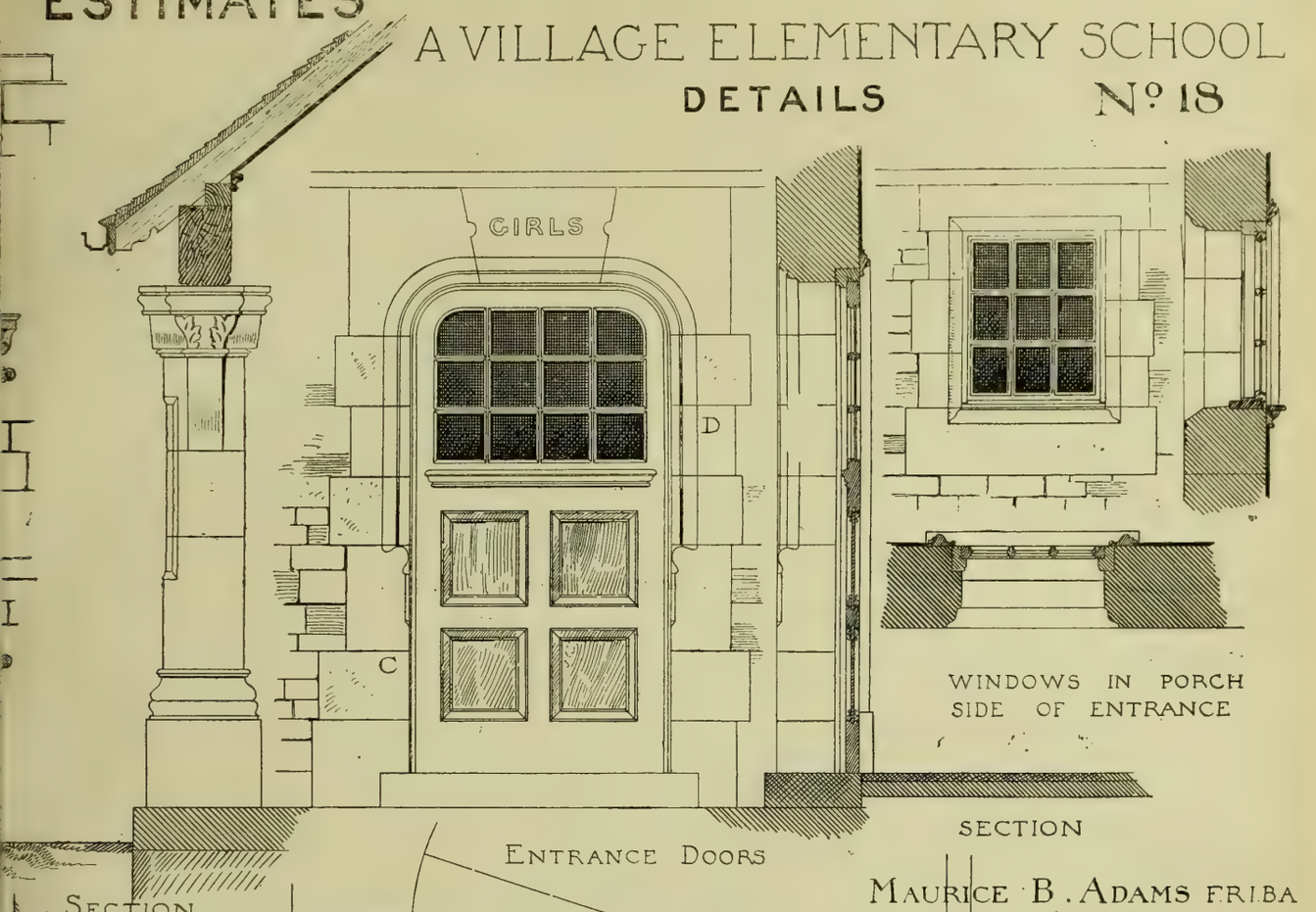
A SCALE OF INCHES TO MOULDINGS

NEWEL TERMINAL

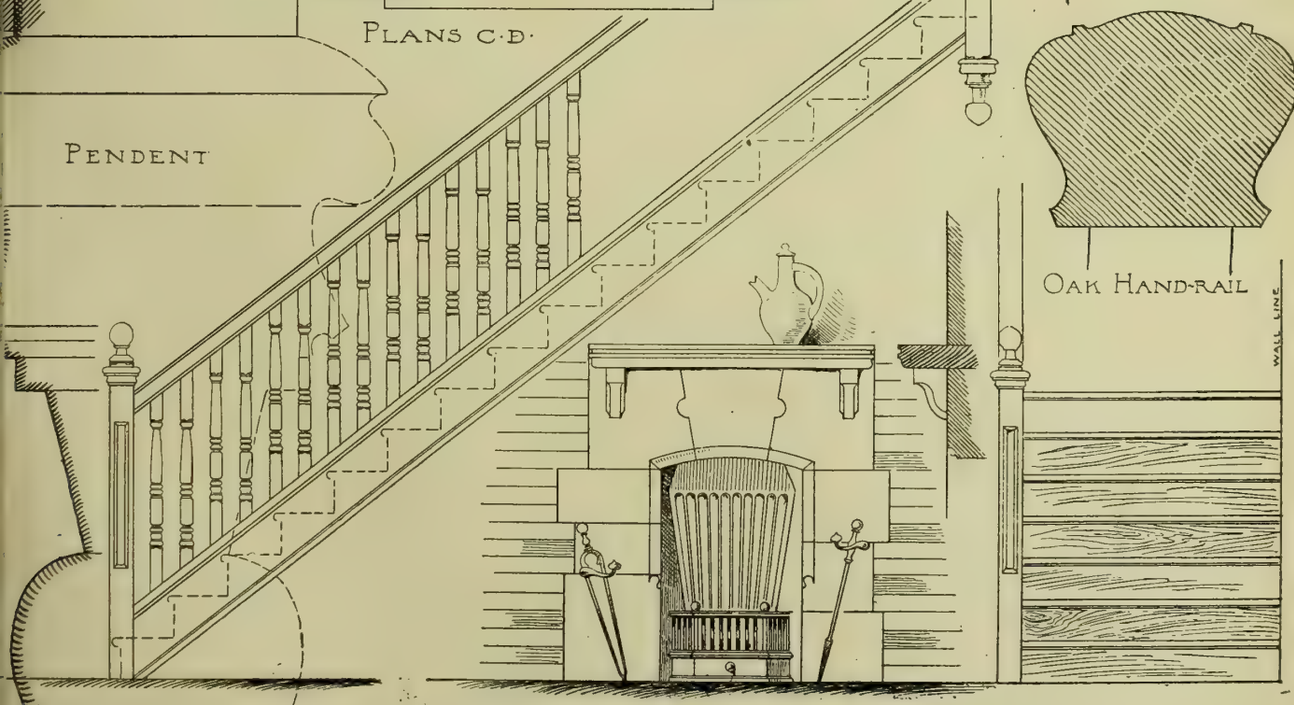
ESTIMATES

A VILLAGE ELEMENTARY SCHOOL

DETAILS No 18

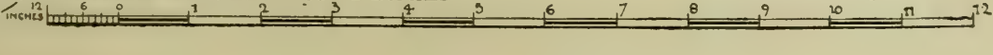


MAURICE B. ADAMS F.R.I.B.A.
Architect



STAIRCASE & FIREPLACE IN ENTRY

SCALE OF FEET TO DETAILS



VISIT OF THE SOCIETY OF ARCHITECTS TO CARDIFF.

THIS year's excursion of the Society of Architects, which has as its centre Cardiff, bids fair to be a great success, the excellent reception and the welcome change in the weather contributing not a little to this gratifying issue. The members travelled to the border-town "capital of South Wales" from all parts of the kingdom during Monday, and were warmly received by the Mayor of Cardiff (Alderman David Jones), who invited them to an informal inaugural meeting at the Assembly Room of the Town Hall, where a conversazione had been arranged by the local architects, acting in conjunction with his Worship. A large number of members availed themselves of the invitation, including the President, Mr. Robert Walker, of Cork. The members of the local committee who assisted the Mayor in receiving his guests were Messrs. Edwin Seward, E. W. M. Corbett, H. Snell, F. Baldwin, H. Bruton, Charles C. Jones, and G. Thomas. The assembly-rooms were decorated for the occasion by Messrs. Howell and Co. A glee party, under the direction of Madame Clara Novello Davies, contributed a programme of glees and songs. But little "shop" was talked, only a few remarks being passed upon the good acoustic properties and quiet decoration of the assembly room, built in 1853 from the designs of the late Sir Horace Jones, in a Late phase of French Renaissance. The party broke up at an early hour.

On Tuesday morning a visit was paid to Llandaff Cathedral, Castle Coch, and Caerphilly, in perfect weather. The party, which met at ten o'clock, were driven to Llandaff, the little country village known as a city, close to the great commercial town of Cardiff. Unfortunately the Cathedral is situated somewhat below the crest of a hill, and so cannot be seen from any point to real advantage, though overlooking the extensive and fertile vale of Glamorgan. No cathedral church in England has so recently emerged from a state of ruin, and its history, as narrated by Mr. J. Coates Carter, was therefore full of interest to the listeners. The first church upon the site, according to local tradition, was built there about A. D. 177 by Lucius; but of that there naturally remains no trace, nor of that erected about the year 516 by Dubritius, the first bishop of Llandaff, while only three rich Norman doorways and the chancel arch can be ascribed to the third cathedral, built under Bishop Urban between 1108 and 1134, and it seems highly doubtful if it were ever finished. Two of the doorways also, which now occupy positions in the north and south aisles, appear to have been moved from their original positions, the Norman church having, it is believed, been much smaller in every way than the existing building. Between 1185 and 1220 the fourth church was built, which, although contemporaneous with Strata Florida Abbey, a "Norman" building, was of the Early English style, such anomalies being somewhat common in disturbed districts such as Wales. The Lady-chapel was added by Bishop Bruys between 1265 and 1287, while the aisles were added and alterations made to the presbytery, even later, the Jasper tower being erected by Jasper Tudor, who was created Duke of Bedford in 1485. Much of this church still remains, the finest portion being the west front, where, over a Norman doorway of somewhat curious design and construction, is an exceedingly fine three-light lancet window, the lights being separated from one another by blind panels, having almost unique convex filling, and with acutely pointed heads. Above this, arranged in the gable, is a rich blind arcade, the central light only being pierced. Unfortunately, the building suffered, as did most others, whether secular or sacred in character, which were built upon the ever-disputed Welch Marches, and it consequently fell into ruin. In the early part of this century the services were held in a modern building erected within the roofless walls of the Gothic cathedral, and built in the most Debased phase of Georgian Renaissance; but in 1844 the restoration of the fabric was seriously taken in hand, and has been mainly carried out under the direction of the late Mr. John Prichard. Wherever possible, he preserved the old work, and where new had to be introduced, followed, as far as was possible, the indications which were found as to the design of the original fabric; but the choir-stalls, south-west tower, and the chapter-house were his own conception and display well his great power of design. The stone of the 13th-century work is mostly that known as Dundrey stone; but the modern stone from the same quarry has not been found to be entirely satisfactory, and the new work is a charming mixture, seemingly haphazard, of Ham Hill, Doulting, and Bath stones. Leaving Llandaff, the plain was traversed so far as the entrance to the Taff Vale, where stands Castle Coch, built upon the foundations of one of the border castles, as a modern Mediæval edifice, this being a whim of the Marquis of Bute, which his architect, the late Mr. William Burges, A.R.A., was only too delighted to carry out. A slight historical sketch of the original castle was given by Mr. E. W. M. Corbett, who said that though there are numerous traditions, there is very little recorded or authentic history. He had drawn largely on G. T. Clark's well-known work on "Mediæval Military Architecture." The Normans, within a century and a half after the conquest of Glamorgan, built a series of castles on the borders of the hill country, and for the protection of the fertile vale of Glamorgan against the incursions of the Welsh, who had been driven into the hill country. Castle Coch was one of these castles. Even if an enemy obtained an entrance into the castle, each of the towers and the hall could be defended for some hours until aid had been signalled for and obtained from Cardiff, distant about five miles. No part of the castle was in the Norman style, and probably it was built in the time of Henry III., or a little earlier than Caerphilly. The restoration was commenced by the Marquess of Bute some 16 or 17 years ago, and was carried out by the late William Burges, and might, Mr. Corbett thought, be considered a faithful restoration, as far, at any rate, as the exterior is concerned. No pains were spared by the noble proprietor and his architect to bring about this result. Fortunately, specimens of mouldings, window heads, ridge tiles, &c., were found to work from, and the old stones have been built in in many instances. The construction of the winding stairs is copied from Caerphilly, the steps being built up of small flat stones. Mr. Burges was much delighted with the construction. Unhappily, he did not live to finish his work, either here or at Cardiff, and a great part of the decoration is the work of his very able successor, Mr. W. Frame. After the reading of the paper, the visitors were conducted over the interior, and, to those who had not previously made acquaintance with Burges's decoration, the sight was little less than a revelation. The lavish use of ornament, perfection of detail, wealth of design, and absolute harmony could not possibly be exceeded. The members next proceeded to Caerphilly Castle, a huge mass of ruined masonry standing in the centre of a neighbouring valley. Here luncheon was served in the ancient Banqueting Hall, and subsequently it was the scene of a formal meeting of the Society of Architects, the president taking the chair at 4 p.m. The formal business was soon disposed of, ten nominations for membership being announced, and Messrs. Robert Stephen Ayling, 15, Kennington-road, S.E., Thomas James Holland, P.A.S.I., 1, Pembroke Cottages, Edwardes-square, W., and Michael Joseph McMullen, B.E., 20, South Mall, Cork, being duly elected as members. The president also announced that Mr. S. Hamilton Townsend, of Toronto, and Prof. G. Hauberrisor, of Munich, had been nominated as honorary members by the Council. A discussion arose, in which Messrs. G. S. Bridgman, A. Swash, J. E. Harvey, E. C. Allam, S. C. Johns, A. Marshall, G. Thomas, H. A. Cooper, and H. Snell took part, originating in a query as to the means taken by the Council to ascertain the position of candidates for election as members, which drifted from subject to subject of comparatively minor interest, until at length that of the Registration Bill was mooted, when the President gave a clear explanation of the position of the measure at the present moment, and urged all who had its success at heart to do their utmost to strengthen the society during the next few years. Perseverance and strength alone were necessary for success, and the greater their strength the less likelihood there would be of their perseverance being too hardly tested.

On Wednesday Cardiff Castle and the docks were visited. If the decoration at Castle Coch was a revelation, that at Cardiff Castle, where Burges was given absolute *carte blanche*, was an inspiration. The general feeling among the visitors was one of pity for such of their professional brethren as did not accompany them, and each left the castle, at the conclusion of the inspection, with a greater love of, and insight into, the higher mysteries of Gothic architecture than he had had in the early morning. Unfortunately, convenience and comfort have been entirely sacrificed at the castle to the desire to reproduce a style which was originated at a time when the system of living was totally different from that of the present day, and this became more and more apparent as Mr. E. W. M. Corbett, who again acted as cicerone, conducted the party from one exquisitely-decorated room to another, up the most dangerously-constructed and inconvenient of staircases, and along the most tortuous of passages. Before leaving, the party inspected the drawing-office, now used by Mr. Burges's able successor, Mr. William Frame, and were greatly struck by the vast accumulation there of plaster models for the sculptured and carved ornament employed in such profusion in the building. Several of them also made a mental note of the fact that some general contract drawings, which they saw, were drawn to the scale of one inch to a foot, as a valuable precedent to be followed where work is of an elaborate character. Passing out of a side gate, the newly-discovered square wall around the castle, of undoubtedly Roman origin, built of the river pebbles, was inspected; and then steps were turned towards the Rhymney Railway-station, where the Marquis of Bute had placed an engine and carriages at the disposal of the Society for an excursion round the docks. Steaming slowly, the various points of interest were pointed out, the 100 miles or so of sidings, floating grain elevator, scouring reservoir, the system of tipping coal by means of cranes, and floating dry docks, to say nothing of the shipping and the basins in which it lay, all being inspected in little more than an hour. A hasty visit was also made to the new works of the Dowlais Iron Company, which, as its manager, Mr. E. P. Martin, explained, had had to be removed from the hills to the new site in consequence of their finding Spanish ore, from its greater richness, more economical for conversion than that found in the locality. Great difficulties, he said, had been encountered in forming good foundations for the heavy furnaces and tall chimneys (230ft. high), some 1,700 piles having been used, averaging 32ft. in length. Space has been reserved for eight furnaces, three of which are now building, while the foundations for a fourth have been put in. After a few words from the President, expressing the sense of obligation which the Society experienced towards Mr. Corbett, the local committee, and especially towards Lord Bute, for so generously throwing open his three castles and the docks for inspection, the party separated, meeting again in the afternoon to enjoy the hospitality of Lord Windsor at Penarth, and to inspect the happily-designed Turner Gallery of Messrs. Seward and Thomas, afterwards paying a hurried visit to the Barry Docks, the great rivals of those at Cardiff.

BOOKS RECEIVED.

Timber, and Some of its Diseases, by G. H. Marshall Ward, M.A., F.R.S., F.L.S., &c. (London: Macmillan and Co.), is an amplification of a series of articles on this subject which appeared in *Nature*. These have been recast in book form, and we may perhaps say that, as a thoroughly scientific exposition of the structure and properties of timber, and the diseases to which it is subject, Mr. Marshall Ward's work holds a high place. The earlier chapters deal with many very interesting questions, such as the theories which explain the ascent of water in tall trees. The author enters somewhat exhaustively into this physiological phenomenon, reviewing various hypotheses, such as the capillary idea, the imbibition theory of Sachs, and the osmosis-pressure theory of Hartig and Godlewski. The chapters on the diseases of timber deal with those which attack the living tree, and those which affect dead timber; in the latter, of course, the subject of "dry rot" is discussed, to which we shall refer at greater length on another occasion. The *modus operandi* of the disease produced by the dry rot fungus, from the germination of the spore to the spread of the mycelium filaments which feed on the wood, is minutely described. The work is well illustrated by sectional diagrams and engravings, and the author has evidently brought

wide and varied reading and experience to bear upon his subject.——*The Law of Water and Gas: a Handbook for Consumers*, by C. E. Stewart, M.A., of the Inner Temple, Barrister-at-Law (London: Effingham Wilson and Co.), is another of the useful legal handbooks brought out by Messrs. Effingham Wilson and Co. Water supply, and the statutes referring to it, the rights and duties of consumers and water companies, are described and set out with clearness, so that any intelligent householder can see for himself what his rights and obligations are. One chief feature of this little guide is that the provisions of the public Acts of Parliament which refer to the subject are summarised. "The Construction of Works," compensation to be paid to owners or occupiers of land; the restrictions of the Lands Clauses Consolidation Act, 1845; the powers of the company to lay down pipes in streets and houses, to enter houses and remove pipes, if refusal is made by occupier or owner to pay for supply, are briefly noticed. "Supply," "Reservoirs," "Fire-plugs," "Protection of Water," "Wells and Pumps," "Water Rates," "Cisterns," "Regulations," are other heads dealt with. Consumers of gas will find the little book give them all information they are in need of as regards their rights and liabilities. Questions relating to gas-meters, price of gas, quality of gas, rates and rents, escape of gas, &c., are here answered.——*Strains in Structures*, by G. A. T. Middleton (Batsford, 52, High Holborn), is a handbook for students — the major portion appeared in chapter form in our columns between July, 1888, and March last. The author thanks the correspondents who criticised the work as it was then published, and acknowledges that certain faults pointed out have been rectified. The little work is intended for the student who already has some elementary knowledge of the theory of strains and stresses; one excellent feature is that the rationale of nearly every form of girder structure is given, and its construction described. The book, which is published at 4s., is illustrated by eighty-nine diagrams, most of which will be recollected by our readers.——*The Railways of India*, Part I. of the Administration Report for 1888-9, by Lieut.-Col. L. Conway-Gordon, R.E., Director General of Railways, has just been issued as a Blue-book. From it we learn that the total length of railways open to traffic in India has increased from 14,383 to 15,245 miles. The chief sections of new line opened were 303 miles of the Indian Midland Railway, 222 miles of the Toungoo-Mandalay extension, and 110 miles of the Bengal-Nagpur Railways. Of this mileage nearly one-third, or 4,998 miles, is worked directly by Government agency, 9,796 miles by guaranteed and assisted companies, and only 451 miles by native States. Sanction has been given for the construction of 680 additional miles of line. The chief engineering work of the year has been the opening in March last of the Lansdowne Bridge over the Indus at Sukkur.

At the recent congress of the British Medical Association at Leeds, a communication from the Worshipful Company of Plumbers was brought forward, pointing out the desirability of a national system of registration of plumbers. Dr. H. Tomkins moved, and Dr. Caldwell Smith seconded, the following resolution, which was unanimously adopted: "That this section strongly approves the movement set on foot by the Worshipful Company of Plumbers, as serious defects in the plumbing work of dwelling-houses are constantly leading to disease and ill-health, and demonstrate the need that exists for the more rigid supervision of plumbers and their work."

The ceremony of laying corner stones of St. Michael's new church, Aberystwith, was performed on Wednesday week. The portions of the church which it is intended to complete under the present contract will cost about £7,000. The structure has been designed by Messrs. Nicholson and Son, diocesan architects, Hereford, in the Early Decorated style. It will consist of a nave, nave aisles, chancel and chancel aisles, and seats will be provided to accommodate about 800 worshippers. The contract has been undertaken by Mr. Price, of Hay.

A three-light window in the north aisle of Tadcaster Church has this week been filled with stained glass as a memorial. The side lights are filled with representations of the Good Samaritan and our Lord comforting the weeping sisters of Bethany. The centre light represents the scene of the Transfiguration. The work was executed by Mr. Constable, of Cambridge.

Building Intelligence.

Hereford.—The new Victoria Eye and Ear Hospital in Eign-street was opened on Tuesday week. It has been erected from designs by Mr. E. H. Lingen Barker, of Hereford and Newport, and is in style Queen Anne, freely treated. A central corridor 7ft. wide running from side to side of the building is the key to the plan. The ground-floor of the right wing is occupied by the kitchen department, the dining-room, day-room, and matron's room. On the left-hand side of the main entrance are the secretary's office, waiting-room, out-patients' bath-room, dispensary, board-room, and surgeon's room. The staircase is almost opposite the main entrance, and the upper floor is divided into two sections of equal size for male and female patients. The principal ward for males, which contains four beds, is situated above the board-room, and that for females, having a like number of beds, over the kitchen. Smaller wards to contain two beds each are provided. Upon this floor are also placed bath-rooms and other conveniences for both sexes, divided off from the corridors by intercepting ventilation lobbies, glazed partitions, with automatically self-closing doors. Small bedrooms for the nurses are provided next the large wards with inspection windows. Means of access to a leaded flat over the day-room are provided from the upper corridor, which is similar in proportions to the lower one. The window sashes are fitted with Waygood's patent self-locking fasteners, and the principal doors have Biggs' brass tubular locks, and Tucker's patent flush bolt locks, and Boyle's exhaust vents are used on the roofs. The walls are of brick, relieved with Bath-stone dressings, and buff terracotta is used as a balustrade. The builders were Messrs. Stephens and Bastow, of Bristol. The contract was £2,350, including extras.

Holbeck, Leeds.—New printing works have just been completed for Messrs. J. W. Petty and Sons. They were designed by Mr. W. S. Braithwaite, South Parade, Leeds, and are situate near to Monk Bridge, in Whitehall-road. The main building is of brick and stone; the central dormer contains an illuminated clock, supplied by Messrs. Potts and Sons, Leeds, the face being 6ft. in diameter. The main building is 143ft. long and 83ft. wide, and rises to a height of 54ft. From this building a large four-story wing runs for a distance of 110ft. to Whitehall-road, having a frontage of 51ft. to that road, and adjoining is a large yard, containing stabling, boiler-house, &c., and a chimney 90ft. high. The building is lit with the electric light, and warmed with hot steam pipes from the boilers. It is open to the roof, which consists of three iron spans, the north side of each span and the south side of the centre one being glazed with Helliwell's patent glazing. Above the floor are two galleries running round the entire building, and varying from 22ft. to 26ft. wide, supported on steel girder joists, from Middlesbrough, by a series of iron pillars, cast by C. H. Taylor, Leeds. The first gallery is utilised for lithographic machinery and the draughtsmen's department, and the upper gallery is devoted to the case department. Altogether, the building contains an area of one acre of floorage.

Inveresk.—On Saturday the foundation-stone of a new hall in connection with Inveresk parish church was laid with Masonic honours. The hall, which is situated in Dalrymple Loan, a short distance from the parish church, is from plans by Mr. J. Macintyre Henry, Frederick-street, Edinburgh, grand architect to the Grand Lodge of Scotland. The style is 14th-century Gothic. The building accommodates about 760 persons, 120 of whom will be accommodated in a small hall or aisle placed at the side of the main building, and having a separate entrance. The aisle will be separated from the large hall by three bays of moulded stone columns and arches, and may be used by itself in the case of small meetings. At each end of the vestibule there will be small waiting-rooms, above which, and extending over part of the hall, will be a gallery accommodating 100 sitters. Two retiring-rooms, a small kitchen, and other places of convenience will be attached to the back of the building. The roof will be divided into bays with dressed wood, principal rafters with circular ribs, the spaces between being plastered. The cost of the building will be about £2,000.

Rickmansworth.—The extensive works of restoration at the parish church are progressing rapidly. The roof has been taken off, the walls pulled down a considerable distance, and the galleries and other interior portions of the fabric torn out. Sir Arthur W. Blomfield is the architect, and he is represented on the spot by Mr. Thomas Gordon. Messrs Goddard and Son, of Farnham and Dorking, are the builders. Their work consists of taking down the old and building a new chancel; clearing out the nave, taking down the roof and part of the walls, and removing the galleries and seating; erecting a nave arcade, with clerestory open to the roof; north and south aisles, with transepts. The church was built about seventy years ago, and was a rectangular building, with a square chancel. In the new scheme will be included organ-chamber, vestries and porch, and a portion of the old walls will be cased with flints. The style followed in the restoration will be Perpendicular. The roofs will be covered with lead. Seating accommodation will be provided in open seats of pitchpine for 550 persons, but the chancel stalls will be of oak. Instead of the old iron pillars, others of Corn Grit stone will be substituted, but for the general work Bath stone will be used. The windows will also be renewed in the Perpendicular style. The old tower-arch has been opened out. The contract is for £4,300.

Wincanton.—A new monastery of the Carmelite Fathers was opened last week at Wincanton. The architect was the Rev. F. Scoles, of Bridgwater; the contractor Mr. J. H. Kitch, of Bridgwater; the foreman in charge, Mr. James Gardner. It is built of Cheriton Hill stone laid in courses, the doors, windows, and quoins being of Bath stone, and the roof, which is battened and felted, covered with Major's Bridgwater tiles. The building is 100ft. long by 45ft. wide, with three floors, on each of which is a corridor running from end to end. On the first floor are —refectory, 29ft. 6in. by 18ft., 11ft. 4in. high; recreation room, 42ft. long by 12ft. wide, and also 11ft. 4in. in height. On the same floor are the infirmary, lavatories, kitchen, scullery, and larder. On the second floor are—library, 30ft. by 18ft. 6in., 9ft. 6in. high; seven cells, each about 8ft. by 13ft. 6in.; bath-room and lavatories. On the third floor the height is 9ft.; here are infirmary, private chapel, 19ft. by 16ft. 6in., sacristy, seven cells, bath-room, and lavatories. There is gas laid on in the corridors, chapel, and offices, and hot-water pipes are laid on all over the house, fireplaces being found only in the infirmaries. In the basement are cellars, wash-house, &c. From this base the cloister connects the monastery with the street, a distance of 120ft., so that when the church is completed the total length of the building will be 260ft. The work has cost about £2,200.

CHIPS.

At a meeting of the Leek Commissioners held on the 20th inst., Mr. W. B. Madin, of Sheffield, was appointed as assistant surveyor.

New schools for the Southampton School Board at Northam are being roofed in, and will be opened in two months' time. Messrs. James Dyer and Sons, of Bevois Town, Southampton, are the contractors.

Mr. T. B. Bolitho, M.P., laid last week the foundation-stone of a building at Penzance, in which it is intended the various science classes of the town shall be held. The building, which is being erected from plans prepared by Mr. Henry White, of Penzance, is being built in keeping with the houses on the Morrab estate. It will contain a lecture theatre 32ft. by 26ft., a students' room 36ft. by 24ft., a laboratory 36ft. by 20ft., two classrooms each 26ft. by 16ft., an assay room, and a balance room. The contract is placed with Mr. Richard Hill, at £1,164.

Mr. Haywood Rider, of the National Art Training School, South Kensington, has been appointed by the committee head master of the Leeds School of Art in connection with the Mechanics' Institution and Literary Society.

Mr. S. Pridham, of Cheriton Fitzpaine, has been elected surveyor to the Crediton rural sanitary authority at a salary of £125 a-year.

At Messrs. Beardmore and Company's Parkhead Forge, Glasgow, the casting took place on Friday of an unusually large shaft for a dynamo machine. Over 70 tons of Siemens steel were run into the mould. When finished the shaft will weigh about 32 tons. The dynamo for which the shaft is intended is being constructed to the order of the London Electrical Supply Corporation, and will be the largest in the world. The casting was successful

COMPETITIONS.

Aberdeen.—For the free library about to be built at the north end of Union-terrace seven designs have been submitted. The library committee of the Town Council has recommended for adoption that by Mr. Alexander Brown, Belmont-street, Aberdeen. The limit of cost is £7,500.

Accrington.—For the proposed Conservative Club three designs were submitted under motto, and that entitled "Beaconsfield" was selected. It proved to be by Messrs. Morley and Woodhouse, of the Swan Arcade, Bradford; the other designs being one by Mr. Henry Ross, of Accrington, the other by Mr. Dixon, of Oldham. The new club will face Cannon-street Baptist Chapel, and will extend from Cannon-street through to Paradise-street. The selected design, which is estimated to cost £7,350 in execution, is in the Queen Anne style, with a central portico, having fluted columns, with carved caps, and an enriched tympanum, with coat of arms in the pediment. Each wing has large bay windows, carried up to the second story, and surmounted by Mansard roofs, with iron crestings and finials. The vestibule opens into reading-room to right, and offices for the secretary and his assistants to the left. Crossing the corridor, there are the grill-room, the library, and a two-table billiard-room on the left, while on the right are card-rooms, &c., and a wide corridor leading to the main staircase, which is to the right. On the first floor there are to the right of corridor a lecture-room and a billiard-room, 60ft. by 20ft., for four tables, a smoke-room and a committee-room at each end, with two bedrooms and a sitting-room in the centre. On the floor above is the large hall, to hold about 800 persons, and around retiring rooms and refreshment bar, lavatories, &c.

Bournemouth.—The design submitted for the Richmond Hill Congregational Chapel, Bournemouth, by Messrs. Lawson and Donkin has been accepted, and the work will be proceeded with at once. The probable cost is stated to amount to about £10,000.

Cromer.—A meeting of the directors of the Town Hall Company was held on Tuesday in last week to consider the designs sent in by competing architects for the proposed town hall. There were twenty-seven hung, each distinguished by a motto. Seven were selected for further consideration, and at an adjourned meeting, held on Thursday afternoon, the set labelled "Experience" was chosen. This proved to be by Mr. George J. Skipper, Opie-street, Norwich, and "Elegance with Economy" was placed second, and was by Mr. A. F. Scott, of Norwich. At a further meeting on Tuesday last, Mr. Skipper attended, and received instructions to prepare the necessary working drawings and specification, so that builders could tender for the work.

Gloucester Public Baths.—This unfortunate competition has assumed a fresh and scarcely more satisfactory phase. All the difficulties have throughout arisen from the city council's attempt to get a shilling's worth of material for their sixpence—to obtain a suite of baths at an impossibly low figure. At Tuesday's meeting of the Corporation the Baths Committee reported that, after revising the plans selected in the recent competition, reducing the quantities originally sent in three times, the lowest tender they had received for the works was £6,960. The council had on a previous occasion fixed £6,000 as the limit of expenditure in this direction, and the committee reported that it was impossible to get what was wanted for this sum. The council came to the same conclusion, and referred the whole matter back to the committee, to be considered without reference to any limit, to see what was the lowest estimate they could get for the realisation of all the corporation wants – swimming, Turkish, and private baths.

Richmond.—Judging from the report of the last meeting of the Select Vestry called to consider the designs for the new Municipal Buildings, for which the premiums have just been paid, it seems that an effort is being made to upset the award of the referee, whose report was recently adopted by the Corporation. Technically, and from a legal point of view, possibly the vestry may be within its rights should the proposal to shelve Messrs. Elkington and Sons, the selected architects, be carried; but clearly it would be unjust in every other sense to employ any other architect, seeing that they were chosen for the work on the recommendation of Mr. Edmeston's report as professional adjudicator, and especially is their position strengthened by the fact that the chosen plan was reported to be, in the opinion of the assessor, the only one which could be carried out for the amount stipulated. No suggestions of unfair influence are suggested, neither is any objection made to the first premiated architects, who, it will be remembered, were the designers of the Richmond public baths. Some of the members, on the plea that the town is able to expend more money than originally intended, urge that Mr. Verity's design, placed second in the competition, should be adopted; but in all common fairness, either another competition should be held among the premiated architects of the first competition, with altered conditions embodying the increased cost now proposed, or the work without further parley should be given to the chosen architects as they at present stand. The promoters fixed the amount at first, not the competitors.

Taunton.—In the competition for a scheme for the prevention of floods and a mode of carrying off the waters of the river Tone in stormy weather in the shortest time, Mr. E. Appleton, the assessor, has awarded the first premium to that under motto "Palmam non sine Pulvere," by Mr. H. Barnes, 30, Great George-street, Westminster, Mr. Radford, of Nottingham, taking, as we announced last week, the second prize.

CHIPS.

The *City Press*, in a paragraph on "Architects as Masters of Companies," says: "Mr. Wyatt Papworth has been elected master of the Company of Clothworkers' for the year ensuing; Mr. J. T. Christopher, of Bloomsbury-square, master of the Salters' Company; and Mr. Banister Fletcher, C.C., master of the Carpenters' Company. Of late years several architects have attained this dignity, as Mr. C. Barry, Mr. T. Cundy, Mr. C. J. Shoppee, and Mr. W. W. Pocock, but probably never before have three members of the profession been elected to such a post in one year—almost in one month."

The town council of Swansea at their last meeting formally adopted the report of the assessor, awarding the premium of fifty guineas for the best design for new market buildings to Messrs. J. Buckley Wilson and G. Moxham, of that town.

The chancel of the parish church of Liskeard is about to be restored, a tender for £1,473 having been accepted from a local builder for carrying out the works.

The personalty of the late Sir James Alanson Picton, of Sandyknowe, near Liverpool, has been sworn at £90,601.

A new window has been placed in the south aisle of St. Paul's Cathedral. It is called the Thanksgiving window, and has been almost as many years in preparation as were the Munich windows which have been removed lately from behind the reredos to the south-east corner of the choir. Messrs. Kemp were the artists.

A directors' trial train ran from Manchester to Wrexham on Friday *viâ* the south curve at Chester, the Dee bridge, and the new railway of the Wrexham Company. This is the first time the journey has been made from Manchester to North Wales by the new route. In the train were Mr. Francis Fox, engineer of the Chester Railway and of the new bridge; Mr. Logan, contractor for the Chester Railway; and Mr. Wooley, contractor for the Hawarden line.

The Municipal Buildings Committee of the Glasgow town council has recommended that the buildings should be publicly opened at the end of September. The committee were equally divided as to whether the opening should take the form of a ball and a conversazione, or a banquet and conversazione, and the question remains to be decided by the town council. The buildings have been frequently illustrated in our columns, and have been erected from the designs of Mr. William Young, of London and Glasgow, by Messrs. Morrison and Mason, of the latter city.

Memorial stones of a new Bible Christian chapel were laid at Tywand Heath, St. Blazey, on the 22nd inst. The building will be of red and white bricks, with pitch-pine fittings, and will be seated for 250 persons. Messrs. Pearce and Sons are the builders.

An organ, built by Messrs. Joseph Burn and Co., of Glasgow, was opened in Plantation parish church, Glasgow, on Friday.

The annual meeting and excursion of the Monmouthshire Antiquarian Society were held on Tuesday week, the place of assembly being Goodrich Castle. A paper on the history of the castle was read by Mr. F. J. Mitchell, the hon. secretary.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., LIV., and LV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Received.—W. T.—B. B. and E.—Y. and M.—W. S.—T. T. and Co.—J. R. T.—G. A. T. M.—R. S. and Co.—M. H. B. and Co.—W. and O.

"Bar Compass."—The instrument you send us a sketch of is a trammel for striking ellipses. Draw two lines at right angles to each other, to represent the major and minor axes of the ellipse, and place the cross with grooves cut in it exactly over them, to coincide with the lines on the ends of grooves. Having fixed the cross by the needle points into the paper, place the bar on a line with major axis, drawn so that the pencil or pen point and the sliding-heads are in one line. The second sliding-head from the pencil point will then be in the centre of the cross. Having unclamped the screws of the sliding-heads, slide the bar till the pencil point coincides with the proposed length of major axis, and clamp the other screw, which slides in the minor axis groove. To set the instrument to the minor axis, move the pen round, and set it upon the mark on the paper for the extent of this diameter, and in this position clamp the major axis slide. The pencil can then be made to describe the ellipse of the given diameters, by simply moving the pencil, and allowing the sliding-heads to traverse the grooves in the cross.

Correspondence.

ST. MICHAEL'S TOWER, COVENTRY.

To the Editor of the Building News.

Sir,—I see that in your notice of the report recently made on this tower by the architects' committee of the Incorporated Church Building Society, you express a wish to have my opinion as architect to the church. I therefore send you a few lines on the subject.

My advice to the committee has always been against putting back the heavy peal of bells into the restored tower. The design is not suited to bear the strain, nor is there any provision except for a light peal hung in the lantern story. Coventry people are naturally most anxious to have the bells back in the tower, and though the Building Committee were probably ready to accept my view, many large subscribers were not, and it was suggested by the vicar that a reference of the question to the Incorporated Society might be a means of preventing a deadlock. I gladly fell in with this proposal, and

the result has been very satisfactory. The architects' committee were unanimous in stating that the bells ought not to be rung in the tower, and their opinion has now been accepted by the Restoration Committee, who have ordered the completion of the interior exactly on its old lines. —I am, &c., J. Oldrid Scott.

31, Spring-gardens, London, S.W., Aug. 22.

ST. ALBAN'S ABBEY.

Sir,—To "Goth" we have only to say that *had* he "been content to say nothing about the sheet of contrasts till he had seen the latest works at the Abbey," it would have been impossible for us to "round" on him. We are sorry for him, but he must not try to put us in the wrong for what is his own fault. We have simply replied to what he has said.

As to how "the ancient painted ceiling affects the main issue of the discussion," it is simply in this way: that *there was no "ancient painted ceiling" to be "stripped off"*—a trifling inaccuracy, but only one of many that have disgraced this controversy.

If "M.'s" intention be to prove our assertion as to the "inaccuracies" and "misrepresentations," he could not have done better than write the two letters published in your columns of August 2nd and 16th; and a finer display of ignorance and insolence combined we should say has seldom been seen.

"Goth" and "M" are alike strangers to us—their very names unknown; but if either of them imagine for a moment that we make statements that we cannot prove, they are very much mistaken; and whether it be for our profit or loss, we shall most certainly challenge any statements that we know to be untrue, no matter who makes them.

With thanks for your courtesy in sparing us so much of your space,—We are, &c.,

Wm. Longmire and Co.

34, Osnaburgh-street, Regent's-park,
London, N.W., Aug. 28.

Sir,—On return home I find the usual crop of letters on St. Alban's, most of them rhetorical or personal. Indeed, when Lord G.'s assailants are at a loss for facts (as they usually are) they commonly resort to friction with the glibness of Home Rule M.P.'s.

1. "Goth" is very disappointing; he condemns the Westminster window and the Rochester designs, neither of which, he admits, he has seen, and he praises the buildings on W. side of Westminster Hall, for which no one has said a good in or out of Parliament, except one or two Board of Works officials. Messrs. Longmire have a legitimate grievance against him, and justly refuse to discuss any other matter with him until he apologises for repeating the exploded nonsense about the stencilled deal ceiling in nave. From his reference to the temperate and unanswerable letters of "A Northern Vicar" most people would consider that it is Mr. Goth who is "beneath contempt."

2. "M." is just the style of architect who brings his profession into discredit by his total inability to estimate the value of work. In his 40 years' practice, I wonder how often he has mulcted his employers in 300 or 400 per cent. more than his estimate? I write this, like all my letters, without any help; but I do know that for seven years, at least, the weekly labour bill at St. Alban's has been at least £100 a week. "M." no doubt knows better than Lord G. himself; but the expenditure *has* exceeded £80,000; and no architect is a penny the better;—"*Hinc illæ lacrymæ.*" There is no "jerry building" in the new work—like Scott's church at Halifax, or Street's at Constantinople, or like the tower at East Sheen by a now fashionable architect, which fell down dead on removal of the scaffolding when I was a boy. As a writer in the *World* said the other day, on revisiting the Abbey after 18 years, it is clear that but for Lord G. it would have fallen down; and there is no one who gets better value for his money, or more objects to letting others spend it for him. In "M.'s" analogy between circular turrets and factory chimneys he forgets that the latter are always tapered, and are never perforated with windows. It is true that the St. Alban's turrets stood many centuries; but so did the towers of Chichester and Hereford, which fell at last, "and great was the ruin thereof." By "A Country Curate" he possibly means "A Northern Vicar"—a fair sample of his recklessness. It is hard to have to teach an architect of 40 years' standing his business; but I may tell him and "A. C. W." that the woodwork referred to in the "N. V.'s" first letter is Scott's great screen in Beverley Minster. At any rate, that is one example of the ornament being tacked on; that in the same church is to be found what he calls a "sham window"; that there is another and larger one at Worcester; and that nearly all the belfry windows in Scott's church at Doncaster are treated precisely as the St. Alban's "Five Sisters"—which, let me again remind your readers, replace a wooden window inserted in 1835. It was Scott, too, who introduced Early English into the S. transept by inserting two lancets in the W. wall.

3. "F.R.I.B.A." reminds me of Lord Beaconsfield's acquaintance, who travelled much and saw little. He has been many times taken over St. Alban's, and cannot discover, even from a former letter of mine, where a course of brown clay occurs in the walling.

4. *Pace* "A. C. W.," there is every analogy between the St. Alban's wheel window, inclosing circles, and the Chartres and Lincoln examples. There is another, by Scott, in Harrow Chapel, and yesterday I saw yet another—I believe by Pugin.

5. Great an adept as Harry Hems is at advertising himself, he has not yet arrived at the dignity of a Royal personage whose movements are of common knowledge. To my knowledge, I have never seen Harry Hems, and he might, so far as I have means of ascertaining, as easily be in Mexico as in Exeter. Of course, it follows that I never said I *knew* he had not seen the Cork or Sarum statuary; although, if he knows those excellent works so well, it is all the more discredit to him that one of your correspondents (an opponent of mine) could describe his St. Alban's work as "Classic" or "Renaissance" in feeling. In spite of the many new heads put on them, I have never, as I said before, heard an artist say a good word for them. I was under the impression I had all through written, as my name implies, from an artistic point. Harry Hems will explain how I have shown any "trade feeling and jealously" in this matter, and why it should be "natural"? Also will he say what is the action—"mean and ungentlemanly" he calls it—in which "Ars" was implicated? I was under the impression that the sole matter in connection with the abbey I had to do with was the repair of the organ, and I defy Harry Hems to prove otherwise. In this controversy I have amusingly been taken for Lord G.—his "young man"—the Dean of Rochester—and now for a "tradesman"—all suppositions equally correct. As to another paragraph in a former letter of mine, Harry Hems may inquire at the abbey, or I shall be happy to inform him privately.

6. When I saw the cross on Winchester reredos last year during service time, from the nave it looked to me and my friends like marble. It is now gone, I know. Mr. Sedding was paid *eleven per cent.* for the first works on the reredos —£220 on £2,000—and if the rest was not carried out from his designs, will Mr. Colson, F.R.I.B.A., explain what use was made of his further drawings, for which (and his estimate) he asked the D. and C. some £270, estimating the cost of completion at £2,338, which the cathedral staff did for £834? And, lest Mr. Colson should deny this, let me tell him that I know Dean Kitchin personally, and have seen these figures in his handwriting.

And now, Sir, I shall trespass no further until a fresh crop of Albanian myths come up.—I am, &c., Ars.

P.S.—If not too late, let me draw your travelling readers' attention to Mr. Luscombe's admirable sculptures at Truro. Harry Hems is said to have taken the St. Alban's figures at £26 each, and of course had to treble or more his estimate, like "M."

Aug. 24.

The city council of Coventry have decided to construct two new covered-in reservoirs, each holding 1,500,000 gallons, at Barker's Butts, and Mr. Thomas Hawksley has been instructed to prepare plans and specifications for the construction of the new reservoirs, and for laying the necessary mains to convey the water to and from them; and to obtain estimates for the execution of the work.

A parish-room and Sunday-schools are about to be added to St. Margaret's, Ilkley, from plans by Messrs. J. and E. Critchley, of Bradford.

Intercommunication.

QUESTIONS.

[10070.]—**Staining New Stone to Correspond with Old.**—I shall be glad if some of your readers will state what is the best method of staining permanently the faces of new stonework, intermixed with old, so as to correspond with latter?—Restorer.

[10071.]—**White Glazed Brickwork.**—I should be glad if any of your readers would say what colour white glazed brickwork should be shown in elevation? Also, should basement window areas be drained? If so, how?—E. H. W.

[10072.]—**Llanaber Church.**—On visiting the old church of Llanaber, Merionethshire, I found that each of the spandrels of the nave arcade was pierced by a hole about 9in. by 9in. The explanation given by the churchkeeper is, that they were intended to receive the ends of joists laid across the nave, and so form a floor over that part of the church. This, he said, was required when the church did duty as a castle, archers being placed at the clerestory windows, and commanding a wide range of country. I never before heard of such a notion, and should much like to hear whether any reader has come across a similar instance elsewhere; or perhaps there is some other explanation?—Graybrow.

[10073.]—**Stamps.**—Would some of your readers kindly inform me the amount of stamp to be placed on contracts for building a Board school? There are seven contractors; will it be necessary to impress each contract with a 10s. stamp? If the proprietor had not been a Board, a 6d. stamp would have been sufficient for each contract.—T. S.

[10074.]—**Cathedrals and Churches.**—I shall be glad if any of your correspondents can tell me whether there is a book published with accurate scale drawings of the different cathedrals and principal churches, or even the smaller parish churches, of England? Also has there been a reliable History of Architecture written since that of Fergusson's, published in 1865?—Young Inquirer.

[10075.]—**Plaster House, Audley End.**—Near the railway I noticed, the other day, when coming up from Cambridge, a very interesting wayside house, covered with enriched plaster work, which, though familiar, no doubt, to many of your readers, is new to to me, and probably many others. Such specimens of old ornamentation are now rapidly becoming scarce, and I have not seen any illustration of this example, though you have published others from time to time. Can any of your numerous artistic correspondents oblige by contributing a good sketch of the house I speak of, with a view to its appearing in your pages.—A Lover of Old Work.

[10076.]—**Fresco Cement.**—Can any architectura reader of the Building News give me information of a practical character how to use fresco cement for external decoration? I am erecting a pair of detached half-timbered houses, and as it has an architectural effect superior to sgraffito work—which, in my experience, I have seldom found satisfactory, I am anxious to make use of it for colour decoration in the gables and panels of the half-timbered work. Is a simple roughing in coat of Portland cement and sand, finished with fresco cement, sufficient; or is it best to plaster in one thick coat of neat cement? Kindly give particulars fully as to how it is used—I presume as other cements—and whether obtainable at all cement makers, and much oblige—Young Architect.

REPLIES.

[10039.]—**Right of Way under Altar.**—My signature seems quite to have turned "M.'s" head. He flatly contradicts and then affirms all I said about the passages at Norwich and Walpole St. Peter—my theory being amply confirmed by the A. A. report in this week's "B. N."—Ars.

[10044.]—**Churches with Chancels not in the same Axis.**—St. Leonard's Church at Clent, in Worcestershire, has its chancel very much inclined towards the south, which would seem to support the idea that it was purposely done, according to the sun's position on St. Leonard's day, November 6th, when its apparent declination is about 23° South. This is all very well; but Lichfield Cathedral, which is dedicated to St. Chad, has its choir slightly inclined towards towards the north; now, the sun's apparent declination on St. Chad's day, March 2, is about 7° South. In both these cases, particularly in the church at Clent, and in many others I have noticed, the inclination of the chancel is very marked, and at once detected when in the building, and could not have been the result of accident, or, as a correspondent suggests, the result of bad setting out. As an example of this latter, I will mention the church of St. Mary-within-the-Castle, at Dover, where the chancel has been so roughly set out that none of the walls are at right angles to each other, obliging the vaulting to be "skewed" most awkwardly in order to make it fit the irregular space. This is a very different thing from a chancel otherwise carefully built, but made to incline in a certain direction. The new R.C. church of St. John Baptist, at Norwich, now being built by Mr. G. G. Scott, is to have the choir and transepts inclined on a different axis to the nave; but I do not know if this is done with regard to the position of the sun on the 24th of June.—A. C. W.

[10056.]—**Wenlock Priory.**—In reply to your correspondent, "M. C.," as to where he can find plans, &c., of Wenlock Priory, he will find the Priory most fully illustrated in "Remnants of Old English Architecture," by Mr. T. Locke, Worthington. If "M. C." cannot obtain this book, I shall be pleased to give him all the information I can from it, or, if necessary, will lend it him for a time.—J. W. Cobb, Fairfield-road, Chelmsford.

[10056.]—**Wenlock Priory.**—Potter's monograph of the abbey in the series, "Remains of Ancient Monastic Architecture in England," gives the plan referred to, I think.—J. D. B.

[10060.]—**Soil-pipes.**—Strong lead soil-pipes will give satisfaction if well fixed and supported. 3½in. diam.

is large enough for a vertical soil-pipe from four w.c.'s; and a pipe of this size, 30lb. per yard, fixed with soldered bands to hook-shaped wall-bats about 3ft. from centre to centre, will give the utmost satisfaction. I cannot advise the use of zinc for soil-pipes, as I have never known of it being thoroughly tested for that purpose. Good tinning would be a decided improvement on the plain copper. "R." states a serious case, which is quite possible under certain circumstances—that is, if the Buchan or other trap is set too near the foot of the soil-pipe, so that the falling water in the soil-pipe at each flush passes through the trap, and not a sufficient quantity remains to form a seal in the trap; consequently the smell from the tail-drain, and perhaps the street sewer, passes up the soil-pipe. Of course, the existence of any trap at a proper distance from the foot of a soil-pipe does not warrant that the soil-pipe is properly disconnected, as tradesmen are often so careless, and do not set traps properly. The case stated by "R." raises the question, Should not soil and waste-pipes be cleaned and brushed as a smoke flue? It would not be a difficult undertaking to scrape and paint the inside of all soil and waste-pipes. With an inspective eye or manhole formed at the foot of each vertical pipe, a small ball could be passed from the top to take down a strong cord with a steel brush or scraper attached, to be drawn through the pipe, and after it is well cleaned, a large, soft brush or sponge, well saturated with red-lead paint, could be drawn through the pipe, and a small quantity of the paint could be poured from the top of the pipe on the top of the brush to insure the inside of the pipe being well coated. The writer prefers to use red-lead paint—three coats inside—in preference to the best solution for coating pipes.—W. B.

[10063.]—**Fire**—In such a case as described by "J. D. S.," I usually take a rough plan of the premises, and make a bill of quantities of the work as it was (not as it might be if rebuilt on an improved plan), and then send in the claim to the insurance office. I may add that I have always been able to settle in a pleasant way; but some clients think that a claim should be made to include a good profit to themselves, and in such cases it is but natural that the company should decide to execute the work.—H. Lovegrove.

[10066.]—**Soil-Pipes.**—"R.," in speaking of outside soil-pipes disconnected at foot, says that lead is soft, and iron corrodes and gets foul inside, and suggests the use of either strong zinc or copper. Now, a great reason for iron pipes getting extra-foul inside and corroding is that they are often put up as they come from the foundry—rough inside, and with a lot of sand adhering. It is a great benefit to them to brush the sand out with a wire brush, and then paint the pipe inside with red-lead paint. Or the pipes may be dipped in Smith's solution at the foundry before being sent out. Iron pipes enamelled inside may also be had, which would give the interior smoothness "R." wishes. This would not be a preventive of all smell, however. As to zinc soil-pipes, the zinc would soon be eaten into holes by the urine or by medicines; so would copper—although much more slowly—if not tinned. I do not think the expense of copper necessary where an improved iron pipe can be got. In cases where the smell from the top of a soil-pipe standing 3ft. above the eaves proves offensive, the pipe might be carried up to above the ridge, or else to above the chimney cans, if a chimney is at hand. If the iron soil-pipe "R." complains of were brushed out inside and allowed to dry, and then painted inside with red-lead paint, it might be an improvement. I have brushed and painted the blow-off pipes of drains inside *in situ*.—W. P. Buchan.

[10067.]—**Workhouse Plans.**—Querist should get Knight's "Guide to the Arrangement and Construction of Workhouse Buildings," published by Knight and Co., 90, Fleet-street.—L. G. C.

[10067.]—**Workhouse Plans.**—The work by Mr. H. Saxon Snell is the best on this subject; the regulations can be obtained by Messrs. Eyre and Spottiswoode. The above can be obtained of Mr. Batsford, High Holborn.—H. L.

[10067.]—**Workhouse Plans.**—Obtain the requirements as given in the Instructions published by the Local Government Board.—G. H. G.

[10068.]—**Lights.**—The point as to alteration of windows was argued years since, and finally decided in the House of Lords. The right of B. to right of light in the wall *a b* is absolute, and if he rebuilds the wall and puts his windows in the same plane, A. has no remedy; but he can build to block up any new windows, or portions of windows, if he does not injure the actual rights. I advise A. not to raise his building, if such raising will injure the lights in the wall *a b*.—H. Lovegrove.

[10068.]—**Lights.**—B. can rebuild his wall and insert new and larger windows in it without forfeiting his rights to the light originally obtained; but A. cannot raise his building to reduce the light coming to B.'s windows, because B. has acquired a right to the light coming over A.'s premises. The cases that have established this rule are "Tapling v. Jones," "Newson v. Pender"; but the law is still not very clear. "If the new light does not include the area of the old light," Mr. Justice Cotton said, "it cannot be said to be a continuance of the ancient light," and a plaintiff cannot seek protection. Yet it is certain A. could not obstruct B.'s windows.—G. H. G.

[10069.—**Ancient Light.**—If the owner of warehouse A. raises his building, he will be liable to an action. The lean-to does not affect the question in the least. A. must not raise a foot.—H. Lovegrove.

[10069.]—**Ancient Light.**—"Builder" cannot raise A.'s wall facing B.'s ancient light, without damaging same; but he can raise the ridge until the slope of roof agreed with the present angle of light, which can be found by drawing an imaginary line from sill of "ancient light" to the eaves of existing building belonging to A. C. could not object to A. raising his wall over him if there are no ancient lights, in the shape of skylights, in his roof. I would advise "Builder" to consult B., and try to arrange matters, if he does not wish to incur legal proceedings.—T. R. W. M., Bath.

[10069.]—**Ancient Light.**—It would not be desirable to raise A. without consulting B., as the latter has a right of light to his window, which every foot to which the roof A.'s raised would injuriously affect.—G. H. G.

PARLIAMENTARY NOTES.

The New Post-Office.—In answer to Mr. Broadhurst, Sir H. Maxwell said on Monday night:—Messrs. Brass and Sons are the contractors for the new Post-office; but there is no reason to believe that they are making arrangements for the sub-letting and fixing of the stonework. The granite is sent from the quarries in Cornwall ready worked, according to the usual practice, and the setting will be done by Messrs. Brass's men. The Portland stone has not yet been ordered.

The Roof of Westminster Hall.—In answer to Mr. Isaacson, Sir H. Maxwell said:—The roof of Westminster Hall, has been recently inspected, and is in good condition, with some exceptions round the dormers on the eastern side. It is, however, proposed to remove these dormers shortly, and to make good any defects.

CHIPS.

St. John's Church, Deritend, Birmingham, an edifice erected in 1785, is being repaired and renovated. The cast-iron window sashes with small panes are being replaced by lights of more ecclesiastical type of toned glass in leaded divisions. The masonry is being restored, the roof reslated, and the tower provided with new terminals. Internally the alterations included the reflooring of building and the replacement of the high, straight-backed pews in the nave with benches. The structural part of the work is being carried out by Mr. S. Surman, contractor, Great Colmore-street, to the designs of Messrs. Thomason and Whitwell, Cannon-street, Birmingham. The reflooring and reseating is to be done by the Midland Joinery Company, Water-street, in the same city.

Work at Lord Penrhyn's slate quarries at Bethesda, Carnarvonshire, is at present confined to five days per week. The announcement of the restriction caused great surprise.

The new granary dock at Jarrow-on-Tyne was opened on Friday. The dock is 330ft. in length, and has a width at entrance of 60ft., and a depth of water over the sill of 21ft. Messrs. Sandeman and Messent, of Newcastle, were the engineers.

The local authority of Neilston, N.B., adopted last week a scheme of water supply for the district prepared by Mr. Haddon, C.E., of Glasgow.

The last archæological excursion for the present session of the Birmingham and Midland Institute took place on Wednesday week, when Kettering, Weekley, Rushton Hall, Rothwell, and Wellingborough were visited.

The second annual exhibition in connection with the South Wales Art Society and Sketching Club was opened at the Public Hall, Queen-street, Cardiff, on Saturday. There is an excellent display of oil-colour paintings.

The memorial stone of a new parish church for Ancrum, N.B., was laid on Saturday. The church is being built from plans by Messrs. Hardie and Wight, Edinburgh, and is in the Early English style, with a slight leaning in some of the window tracery to a more advanced period. The walling is of red sandstone, chiefly from Herriotsfield quarry, a special gift, and the estimate for the whole work is £1,690.

The first municipal official of a new class has this week been appointed at Liverpool. The post is that of inspector of electric lighting, and in response to a tentative offer of £150 per annum the corporation of that city received 47 applications. This number was reduced to five by a committee, and on Tuesday Mr. E. H. Yeatman, at present assistant electrician to the Ward Electrical Car Company, Limited, London, was elected.

The corner stone of the new town hall for Bakewell was laid with Masonic ceremony on Wednesday week. The building will cost £3,500, and will comprise a large hall, Freemasons' room, magistrates' and county court rooms and offices. Mr. Raymond Slater is the architect.

The half-yearly report of the engineer of the Manchester Ship Canal, Mr. E. Leader Williams, is of a highly satisfactory character. No unforeseen difficulties have arisen in the actual work of the canal with regard to the physical nature of the obstacles to be encountered. Two large docks are very nearly finished at Salford, and the river has been successfully diverted to form a third arm of the Manchester and Salford Docks. At Eastham very good progress has been made with the large locks at the entrance to the canal. Out of the 44,143,284 cubic yards estimated as the quantity of excavation required, there are only 25,080,666 cubic yards remaining to be excavated. At the present rate of progress the whole of the excavations will be carried out within three years from the commencement of the canal. The contractor is Mr. Jackson, of Westminster, who has at present upwards of 12,000 men and boys at work, and the largest array of modern railway plant ever brought together.

WATER SUPPLY AND SANITARY MATTERS.

Cardiff.—The Mayor and Corporation paid a visit of inspection to the new waterworks at Cwm Taff, Brecknockshire, last week. At Cefn, near Merthyr, a halt was made to examine the new balancing reservoir, which now stands completed, and here the party was joined by Mr. J. Mackay (the contractor) and Mr. Mackay, jun. A passing glance having been given to the site of the No. 3 reservoir, the journey was continued onward and upward to the site of the No. 1 reservoir, or the first of the chain of lakes whence Cardiff will derive its future water supply. Then a return was made to the No. 2 reservoir at Cwm Taff, where the work of constructing the great dam across the mouth of the valley is in progress. Mr. Mackay has about 400 men at work on the dam, and 100 more at the clay pits and quarries. Since he entered upon his contract at the end of March last 20ft. of the work pertaining to the 90ft.-high embankment has been done. The dam will link the hills where they are 1,000ft. across, and at the base it will be from toe to toe nearly a quarter of a mile in width, sloping up to 30ft. in width at a height of 90ft. from the base. It will be traversed by the high road, and the water of the reservoir at this point will be 80ft. deep. This lake will be about a mile and a half long and three-quarters of a mile at its greatest width, the contents being 300,000,000gals. The embankment foundations have been laid 30ft. below the surface (making the total height of the dam 120ft.), and in it will be used 40,000 tons of puddled clay, and 30,000 tons of concrete, while in the by-wash steps there will be no less than 10,000 cubic feet of granite. The clay for puddling is brought from the Aberdare Mountains. The work is being carried out under the direction and from the plans of Mr. J. A. B. Williams, waterworks engineer to the Cardiff corporation.

The Destruction of Sewer Gases in Leeds.—At a special meeting of the Sanitary Committee of the Leeds Corporation held on Wednesday—the Mayor presiding—the important question of how sewer gases might be rendered innocuous was considered. It was stated that Messrs. Nicholson, manufacturing chemists, Hunslet, near Leeds, make large quantities of vitriol and other chemicals from pyrites and copper, the refuse from which contains a large per-centage of sulphate of iron. Samples of the waste product have been analysed by Mr. Fairley, the borough analyst, and he reported to the committee that while it was found that the flow of the refuse liquid through the drains in the particular district where the works are situated had the effect of destroying, to some extent, the joints of the pipes, at the same time it destroyed all germs and entirely prevented fermentation and decomposition, and thereby stopped the formation of gases of a dangerous character. Mr. Fairley suggested that cisterns should be built in different parts of the borough, that the refuse liquid should be carted to these cisterns, which should have taps, and that it should be allowed to run gently day and night into the sewers. That, it was stated, would have the effect of purifying to a great extent the whole of the sewers in the borough. Messrs. Nicholson produce about 80 tuns per day, and this quantity they would undertake to supply to the Corporation at one shilling per tun. The cost of carting and distributing has been estimated by the borough engineer (Mr. Thomas Hewson), at about £5,000 per annum. It was proposed that experiments should be made in a certain section of the borough with the refuse, but that before these were begun the sewage matter and gases should be analysed, and the results recorded, and that after the experiments another analysis should be made, so that the results could be compared. Mr. Hannam suggested that in another district they should ventilate the sewers by means of shafts connected directly with them, and that heat should be applied to destroy the gases and to cause a circulation of air. He also proposed that the same tests should be made as in the other case. Alderman Emsley thought that before either of the experiments suggested were tried, the town clerk should be instructed to communicate with twenty of the largest towns in England, and to ask what system, if any, was applied for the destruction of sewer gases. He moved a resolution to that effect, which was carried.

The freedom of Dundee is to be presented to Mr. Arrol, contractor for the Tay and Forth Bridges, and the ceremony will probably take place in November.

The new technical school at Bingley, Yorks, will be opened by the Master of the Clothworkers' Company on October 3rd. The building is Gothic in style, and two stories in height.

St. Sidwell's Church, Exeter, has been reopened after being repaired and renovated under the direction of Mr. E. Ashworth, of that city. Messrs. Tree and Bolley carried out the works.

Our Office Table.

A COMMUNICATION has been made to the Secretary of State for Scotland, on behalf of 171 members of the architectural profession in Scotland, asking that the completion of the proposed new or supplementary charter for the Royal Scottish Academy should be delayed to permit of fuller consideration of the subject. Much dissatisfaction exists, it is said, in the architectural profession in Scotland, with the past administration of the Academy and its funds, which the new charter in its proposed form does not remove. Mr. Hippolyte J. Blanc, past president of the Edinburgh Architectural Association, points out that nothing hitherto has been done by the Academy for either architecture or sculpture—no instruction of any sort is offered for architectural students, and there are no classes for modelling, and he contrasts the supineness of the R.S.A. in this report with the numerous free schools and liberal prize lists offered by the sister Academy at Burlington House. A thorough scheme of teaching is required from the Scottish Academy, and before that can be matured all the arts should be represented on the council. At the present time there is not one practising architect on the R.S.A. roll of membership.

IN an obituary notice of the late John Gregory Crace, who died on the 13th inst., at the age of 80 years, the *Society of Arts Journal* mentions that he was the fourth in descent of a race of artistic decorators. His father, Frederick Crace (whose fine collection of London views was acquired some ten years since for the British Museum), was the son of John Crace, who was born in 1754. John Crace's father (Edward) decorated the Pantheon in Oxford-street in 1771, and in 1780 was appointed by the Crown curator of the pictures in the Royal palaces. Mr. J. G. Crace was selected by Government, in 1848, to execute the coloured decoration of the new Houses of Parliament. He was largely employed at the Exhibition of 1851, and designed the decorations for the Art Treasures Exhibition at Manchester, in 1857. In 1861 he was employed in the decoration of the Waterloo Chamber at Windsor Castle. In the following year he was engaged on the Exhibition of 1862. He decorated the Society of Arts meeting-room when it was last repaired, in 1882, as he had done on previous occasions.

AT the examinations of plumbers for registration held on Saturday at the Guilds Institute, applicants were present from various parts of London, as well as from Salisbury, Oxford, Worcester, Reading, Gosport, Swansea, and Derby. The examinations embraced tests in joint-making, lead-laying, &c., and a set of questions relating to the qualities of materials, the construction of various forms of house-fittings, and the principles of sanitation. The examiners were Messrs. Chas. Hudson, J. C. Ashdown, C. T. Millis, G. Davis, and L. F. Gilbert, representing the United Operative Plumbers' Association of Great Britain and Ireland. Nearly two-thirds of the applicants succeeded in passing the examinations, one-half of the successful candidates being masters.

A COURSE of instruction has been arranged for apprentice plumbers at the Merchant Venturers' School, Bristol, between 1st October and the end of April. The course will comprise subjects specified in a special syllabus prepared by the Plumbers' Company—among them being elementary geometry in its various relations to plumbers' work; the elements of descriptive geometry with special reference to the reading of working drawings; freehand drawing, including dimensioned sketches; hydrostatics and hydraulics as far as necessary to enable pupils to understand the action of simple appliances; chemistry and metallurgy. Workshop practice will be conducted on two nights in the week. The course of instruction will be assisted by demonstrations in the chemical laboratory, and will be followed by examinations, at which prizes will be awarded by the Company.

AN important addition to the series of large architectural casts in the Museum of Science and Art at Edinburgh has just been finished. It is a reproduction, in plaster of Paris, of the tabernacle in the Church of St. Léonard, at Léau, in Belgium. The original, which is executed in freestone, is one of the most highly-enriched examples of Belgian work of the Renaissance period, the date of its completion being 1554, and the sculptor Cornelius de Vriendt. It is fully 50ft. high, and its greatest diameter is about 12ft. The tabernacle is pyramidal in outline, and on plan is hexagonal. It is divided into nine stages in height, each finished with an enriched frieze, and at each end of the six angles on every story is placed a statuette or other carved figure. Between every pair of these in most instances there are sculptured groups. In the two lower stories a niche is recessed on each face of the hexagon, and between these at the angles there are atlantes below, and above them a row of caryatides, both having abaci with Ionic volutes. On the third story from the ground the faces are recessed for the sculptured groups, and the angles formed into canopied niches for the statuettes. This section forms the most striking feature of the tabernacle. The five stories above it pretty closely resemble each other in detail. Except in the second tier, which is partially occupied by painted decorative panels, all the niches are filled with groups. Four of these in the lowest tier represent the Creation of Eve, the Temptation, the Expulsion, and the Death of Abel. On the third tier, the corner statuettes include the Four Evangelists. The female statuettes typify Faith, Hope, and Charity. The groups above represent scenes in the lives of saints, incidents in Church history, and monks, priests, and bishops engaged in various services. The single group occupying the centre of the highest stage of the tabernacle represents the crowning of the Virgin; the finial is a pelican vulnant. The work has been intrusted by Sir R. Murdoch Smith to Mons. F. Simon of Brussels.

AN appeal is made to the wealthy to keep Camber Castle in preservation. It stands, or rather tends to sink, on Romney Marsh, between Winchelsea and Rye, and dates from the time of Henry VIII. Had Thackeray lived to finish "Denis Duval," a romance might have been woven about the ruin which would have interested the public quite as much in it as Scott's readers have been fascinated by such rude structures as Norham Castle. No provision for this stronghold seems to have been made in the Act for the Preservation of Ancient Monuments. Some gentleman of means, ambitious of territorial distinction, has here an opportunity of acquiring an ancient castle, to which he may point as belonging to the family. The public might, and the profession certainly would, prefer that he did not restore it in accordance with designs "out of his own head." The results of the accomplished amateur's labours, although abundantly satisfactory to himself, do not invariably meet with so kindly a reception from the outside world.

THAT the iron trade is reviving is beyond question, and we have this week to chronicle the opening of an extensive new foundry by the Southwark Foundry Co., Limited, in Orange-street, Southwark, S.E., adjoining the works of Messrs. Hayward Brothers and Eckstein, the well-known manufacturers of Hayward's semi-prism pavement lights, of Union-street, Borough, S.E. The new works have been well built (all work is in cement), and are fitted throughout with every appliance requisite for carrying on a very large trade with promptitude, and as the site is very central for delivery in the City, builders and others will find this foundry a great convenience where time is an object. The buildings have been completed by Messrs. Holloway Brothers under the superintendence of Messrs. Ford and Hesketh, architects, of 21, Aldermanbury, E.C.

THE United States Civil Service Commission has recommended to the President that the rules governing the appointment of employés in the office of the supervising architect of the treasury be changed so as to permit of the employment of the best talent in that profession. It was shown by the investigation of the office before a senate committee last winter that the better class of architects will not submit to a competitive examination for appointment, and that consequently the supervising architect has been hampered by his inability to obtain desirable men.

Walworth Wesleyan Chapel and school premises were reopened this week after renovation and interior decoration in colour. The work has been executed by Mr. Charles Goad, of Camberwell-road, from the designs and under the direction of Mr. T. E. Lidiard James, architect, of Lonsdale Chambers, 27, Chancery-lane, W.C.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Clerks of Works' Association. Monthly meeting. Carpenters' Hall. 8 p.m.
TUESDAY.—Glasgow Architectural Association. "The Decorated Style of English Gothic," by Wilson Beaton.

Architectural Association, 9, Conduit-street, W.—Members desiring any alteration of their addresses in the Brown Book are requested to send notice of same to Mr. Hampden W. Pratt, 6, Duke-street, Adelphi, immediately.

FREDERIC R. FARROW, ERNEST S. GALE } Hon. Secs.

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Bage, F., 22, Slater-street, Liverpool.
Carter, T. J., 4 and 8, Broad-street, Margate.
Dixon, J., Sandgate, Penrith.
Dykins, W. H., 8, Stanley-crescent, Holyhead.
Gregory, J. P., 12, Legontium-terrace, Carnarvon.
Hannah, A. J., 19, Aigburth Vale, Liverpool.
Henry, W., King-street, Castle Douglas, N.B.
Holbrook, J. H., 4, Denmark-street, Bristol.
Jones, P. E., 289, High-street, Bangor.
Maynard, D., 29, Dean-street, Scarborough.
Muncaster, W. D., 57 and 59, Botchergate, Carlisle.
Roberts, J. G., 35, Allen-buildings, Bridge-street, Chester.
Shorrocks, E., 171, King-street, Oldham.
Smart, C., Tarporley, Cheshire.
Walker, T. B., Beaumaris, Anglesey.
and
Godfrey, J. S., Old Fore-street, Sidmouth, Devon, Formerly Provincial Journeyman.

PROVINCIAL JOURNEYMEN.

Atkinson, M. D., 33, Castlegate, Penrith.
Bailey, W., 56, Rossett-street, Anfield, Liverpool.
Charlton, A. D., care of Messrs. Fry and McFarlane, 16, Cook-street, Liverpool.
Fagan, T., 2, Horwick-street, Kensington, Liverpool.
Goad, J. A., 48, Portland-street, Lancaster.
Hill, E., 50, Nelson-street, Carlisle.
Hobday, J. G., 78, Northumberland-road, Margate.
Kennedy, J., 39, Goldsmith-street, Liverpool.
Lawson, W., 9, Bridge-street, Bootle, Liverpool.
Little, T. A., 8, Stanhope-street, St. Helen's, Lancs.
Lowe, W. J., Kendrick's Cross, Rainhill, near Prescot.
Meadows, J., 15, Yanwarth-street, Smithdown-road, Liverpool.
Potter, W. H., 62, Cairns-street, Princes-avenue, Liverpool.
Robertson, J. M., 35, Carrington-street, Park Way, Liverpool.
Taylor, R. F., 43, Frodsham-street, Chester.

THE WORSHIPFUL COMPANY OF PLUMBERS, 1, Adelaide-buildings, London Bridge, E.C.

CHIPS.

A new parish room has been erected at Hay, Brecon, and special attention has been paid to the ventilation, Messrs. Robert Boyle and Son's latest improved patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air, and fresh air admitted by their improved air inlets.

The parish church of St. Peter, Mithian, near Perranzabuloe, Cornwall, which was built in 1847, and stands 500ft. above the sea in an exposed situation, has suffered much from the weather. About £600 s about to be expended on the restoration of the spire, roofs, and windows in accordance with a specification and report drawn up by Mr. J. Piers St. Aubyn, of London.

At Homerton, on Wednesday afternoon, Dr. G. C. Miller, the chairman of the Hackney Board of Guardians, laid the foundation-stone of a new block of building to be erected at a cost of £20,000, for the purpose of giving increased workhouse accommodation to Hackney. The buildings will possess many novel and striking features, and are being constructed from the plans prepared by the architect, Mr. W. Barnett, of Winchester House.

Llangua Church, on the banks of the Monmouth, was reopened on Thursday in last week by the Bishop of Hereford after restoration, a work carried out by Mr. Welsh, of Hereford.

An inquiry was held before Mr. J. Thornhill Harrison, an inspector from the Local Government Board, at the Westminster Free Library, Great Smith-street, on Tuesday week, as to an application from the local authorities for the sanction to borrow £20,000 for the building of a free library, baths, and wash-houses for St. Margaret's and St. John's parishes, Westminster, the Church House Corporation having intimated that they had acquired, and would soon require, the present free library premises. Mr. F. James Smith, architect, explained the plans, and mentioned that the existing building was the first institution of the kind established in the metropolis. The new site will be in the immediate neighbourhood.

Holloway's Ointment and Pills.—These remedies are unequalled throughout the world for bad legs, wounds, foul sores, bad breasts, and ulcers. Used according to directions given with them there is no wound, bad leg, or ulcerous sore, however obstinate or long standing, but will yield to their healing and curative properties.

Trade News.

WAGES MOVEMENTS.

Edinburgh.—The slaters of Edinburgh have made a demand for an increase of ½d. per hour, to bring their wages up to 7½ per hour.

Greenock.—In response to a demand for an increase of ½d. per hour, the master slaters of Greenock have offered to advance the wages to the desired figure, commencing on 15th November. This the men agree to accept, and three months' notice must be given on either side before a change can be made.

Airdrie and Coatbridge.—The slaters of these towns came out on strike at the end of last week for an advance of ½d. per hour. The masters of Airdrie have conceded to the demand, but the men at Coatbridge have been less fortunate, and remain out.

DOULTING FREESTONE.

THE CHELYNCH STONE.—The Stone from these Quarries is known as the "Weather Beds," and is of a very crystalline nature, and undoubtedly one of the most durable Stones in England.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

Abbots Langley, Herts.—For general repairs to the Manor House, for the President and Fellows of Trinity College, Oxford, and Sydney Sussex College, Cambridge. Mr. C. P. Ayres, 52, High-steeet, Watford, architect:—

Stone, J.	£725 0 0
Brightman, C.	714 0 0
Turner, T., Ltd.	694 0 0
Hales, J., Hemel Hempstead*	595 10 0

Rest of Watford.
*Accepted.

Aylesbury.—For paving a length of 500 yards in the New-road, for the Local Board of Health:—

	Per yard.
Patent Paving & Construction Co.	4s. 0d.
Homan, E., London (accepted)	3 6

Barmouth, N. Wales.—For the construction of St. John's Church:—
Winnard, W., Wigan (accepted).

Bishop Stortford.—For kiln, &c., at Bishop Stortford, for Mr. J. Taylor and Sons. Messrs. Inskipp and Mackenzie, No. 5, Bedford-row, W.C., architects. Quantities by Messrs. R. L. Curtis and Sons, 119 and 120, London Wall:—

Hitch	£1,805 0 0
Brown	1,750 0 0
Glasscock (accepted.)	1,599 0 0

Bishop Stortford.—For kilns, at Bishop Stortford, for Messrs. Barclay, Perkins, and Co. Messrs. Inskipp and Mackenzie, No. 5, Bedford-row, W.C. Quantities by Messrs. R. L. Curtis and Sons, 119 and 120, London Wall:—

Glasscock	£6,570 0 0
Kirk and Randall	6,355 0 0
Bell and Son	6,297 0 0
Brown (accepted.)	5,980 0 0

Boxmoor, Herts.—For rebuilding two water-mills, for the Grand Junction Canal Co. Mr. C. P. Ayres, 52, High-street, Watford, architect:—

Neal, W. B.	£2,328 0 0
Dove, H. M.	2,325 0 0
Turner, T., Ltd.	2,240 0 0
Waterman, G. and J.	2,147 0 0
Payne, J., Hemel Hempstead	1,995 0 0
Andrew and Sons (accepted)	1,963 0 0

Rest of Watford.

Bristol.—For keeping in order the trees in the various thoroughfares during one year, for the city council:—

Parker, F. T.	£170 0 0
Garraway (accepted)	90 0 0

Charlton.—For Wesleyan schools, Lower-road, Charlton. Mr. H. H. Church, Woolwich, architect:—

Staines and Son	£1,950 0 0
Holloway, J.	1,690 0 0
Proctor	1,350 0 0
Covil (accepted)	1,150 0 0

Carnarvon.—For the erection of an infectious diseases hospital, for the town council:—
Hughes, J., Carnarvon (accepted) £1,230.

Catsfield.—For the erection of hunt stables, for the Right Hon. Lord Brassey, K.C.B. Mr. A. Wells, 25, Havelock-road, Hastings, architect:—

Taylor Bros., Hastings	£1,535 0 0
Jenkins, P.	1,537 0 0
Eldridge and Cruttenden	1,530 0 0
Cruttenden, H. E.	1,519 0 0
Salter, T. (accepted)	1,491 0 0

Rest of St. Leonard's-on-Sea.

Cambridge.—For roadway bridge over river Cam, and approaches, for the Cambridge Corporation and the local board of Chesterton. Mr. J. J. Webster, M.Inst.C.E., 67, Lord-street, Liverpool, and Mr. F. Waters, 1, Sydney-street, Cambridge, engineers:—

	No. 1.	No. 2.	No. 3.	Nos. 1 & 3.	Total.
Renshaw, King, & Co.	£4,775 0 0	£4,799 0 0	£2,330 17 8	£28,921 19 8	12,799 1 7
Page and Co.		4,382 0 5	2,680 19 8	8,374 0 11	11,593 12 5
Heeman and Froude		4,076 0 0	2,546 15 0	7,233 4 0	11,566 13 0
Lysaght, J.		3,934 15 2	1,922 12 2	6,678 12 2	11,101 19 8
Handyside and Co.	6,591 2 0				11,069 11 6
Mills, G. F. A.	5,693 1 3				
Bush, J.	4,736 9 0				
Cook, J.	4,756 0 0				
Thoday and Son	5,402 6 10	4,302 9 0	3,094 5 9		9,706 15 3
Cockrane and Son	4,480 14 2	4,504 16 3	2,608 2 0		
Gibson, T.	5,105 13 0	3,743 17 0	2,717 3 0		
Double, G.	4,683 6 4	3,981 10 0	2,437 3 4		
Holme and King	4,954 18 3	4,044 15 3	2,059 18 0		
Pickthall and Son					
Mackay, J.					
Bury St. Edmund's (accepted)	3,902 13 0	3,539 6 6	2,261 15 9		

Contract No. 1.—Earthwork, masonry, &c. Contract No. 2.—Steeland Ironwork.
Contract No. 3.—New broadway.

Colchester.—For new water-closets at the workhouse, for the Board of Guardians of the Colchester Union. Mr. J. W. Start, Cups Chambers, High-street, Colchester, architect:—

Mills, E.	£260 7 6
Howe, J.	258 0 0
Cole, A. E.	239 10 0
Johnson, J. H.	236 10 0
Rogers, W.	227 15 0
Dupont, F. (accepted)	193 0 0

All of Colchester.

Congleton.—For new hot water heating apparatus, new galleries and screens, oak block, and concrete flooring, &c., for the Corporation. Messrs. W. Sugden and Son, Leek, architects. Quantities by the architects:—
Accepted tenders:—

Haden and Son, Trowbridge	£885 0 0
Brown, T., Congleton	885 0 0
Lowe, R., Farnworth	885 0 0

Coventry.—For building factory, Spon-street, for the Coventry Watch Movement Manufacturing Company, Ltd. Mr. H. W. Chattaway, Trinity Churchyard, Coventry, architect:—

Hill, C. G.	£1,437 0 0
Worwood, J.	1,344 0 0
Haywood, C.	1,315 0 0
Kelley and Son	1,295 0 0
Garlick, C. (accepted)	1,190 0 0

All of Coventry.

Diss, Norfolk.—For enlarging the board schools:—
Wright, G. E., Diss (accepted) £200 0 0

Doncaster.—For laying mains between North-street and Cooper-street, and between Spring-gardens and Waterdale, for the town council:—
Harlin, I. (accepted.)

Epping.—For erecting a pair of semidetached houses and boundary walls on the Kendal Lodge Estate. Mr. W. H. Pertwee, 14, Clifford's Inn, E.C., architect. Sanitary and plumbing work by Messrs. J. Smeaton and Son, 56, Great Queen-street, W.C.:—

Falkner, J. W.	£2,799 0 0
Bentley, J.	2,689 0 0
Beale, J.	2,658 0 0
Martin, Wells, and Co.	2,452 10 0
North Bros. (accepted)	2,394 0 0

Epping.—For erecting residence and boundary walls on the Kendal Lodge Estate. Sanitary and plumbing work by Messrs. J. Smeaton and Son, 56, Great Queen-street, W.C. Mr. W. H. Pertwee, 14, Clifford's Inn, E.C., architect:—

Beale, J.	£1,770 0 0
Martin, Wells, and Co.	1,700 0 0
North Bros.	1,665 0 0
Allen, J., and Sons	1,640 0 0
Falkner, J. W.	1,597 0 0
Dupont, F., Colchester	1,535 0 0

Finedon.—For the erection of shoe factory, for the Tingdene Co-operative Boot and Shoe Manufacturing Society. Mr. C. H. Payne, Richmond-road, Cambridge, architect. Quantities by the architect:—

Tite, B., Finedon	£654 0 0
Downing Bros., Finedon	630 0 0
Henson and Chapman, Finedon	630 0 0
Barlow, E., Kettering	625 0 0
Abbot, S., Finedon*	625 0 0
Ward, J., Irthlingboro	600 0 0

* Accepted with modifications.

Foleshill.—For repairs to Edgwick and Foxford schools, for the Foleshill school board:—
Bricknell, W. (accepted.)
[Lowest of six tenders received.]

Folkestone.—For the erection of a shelter and tool house in Radnor Park, for the Corporation:—
Mercer, H. R., Folkestone (accepted) £190.

Hackney.—For the erection of the mission church of the Good Shepherd (in connection with St. Philip's, Dalston), in Wilman-grove, London Fields, for the Building Committee. Mr. W. G. Shoebridge, 158, Strand, W.C., architect:—

Mollete, J. H.	£676 0 0
Anley, J.	597 0 0
White and Co.	593 0 0
Walker, J.	579 0 0
Turtle and Appleton (accepted)	578 0 0

Hanwell.—For the erection of temporary wards and school, for ophthalmic children at Hanwell, for the managers of the Central London School District. Messrs. H. Jarvis and Son, 29, Trinity-square, S.E., architects:—

Perry and Co.	£25,200 0 0
Mowlem and Co.	24,737 0 0
Lawrance, E., and Sons	22,750 0 0
Croaker, W. and F.	22,200 0 0
Peto Bros.	21,277 0 0
Brass, W., and Sons	20,935 0 0
Wall Bros.	20,649 0 0
Kirk and Randall	19,639 0 0

Hastings.—For the construction of a new landing-stage, at the pier-head, for the directors of the Pier Company:—

Winser, of Hastings (accepted)	£4,796 10 0

Hornsey.—For making up Elm-grove, Crouch End:—

Mowlem and Co., Westminster	£1,291 0 0
Dunmore, T. G., Crouch End	1,233 0 0
Bell, G., Tottenham	1,059 0 0
Jackson, F. A., and Son, Stroud Green-road	1,055 0 0
Adams, T., Kingsland	980 4 3
Hudson, S., Crouch End*	969 15 3

* Accepted.

Hornsey.—For new storm-water sewer, Campsbourne estate, Hornsey:—

Mowlem and Co., Westminster	£2,901 0 0
Willmott and Sons, Hitchin	2,630 0 0
Bell, G., Tottenham	2,496 0 0
Walker, A., Holloway	2,450 0 0
Dunmore, T. G., Crouch End	2,357 0 0
Holme & King, Euston-road	2,321 0 0
Adams, T., Kingsland	2,295 4 3
Jackson, F. A., & Son, Stroud Green-road (accepted)	2,110 0 0

Islington N.—For new front, and other alterations to Nos. 224, and 225, Upper-street, for Mr. T. R. Roberts. Mr. J. Kingwell Cole, M.S.A., 28, Mount-street, Grosvenor-square, W., architect:—

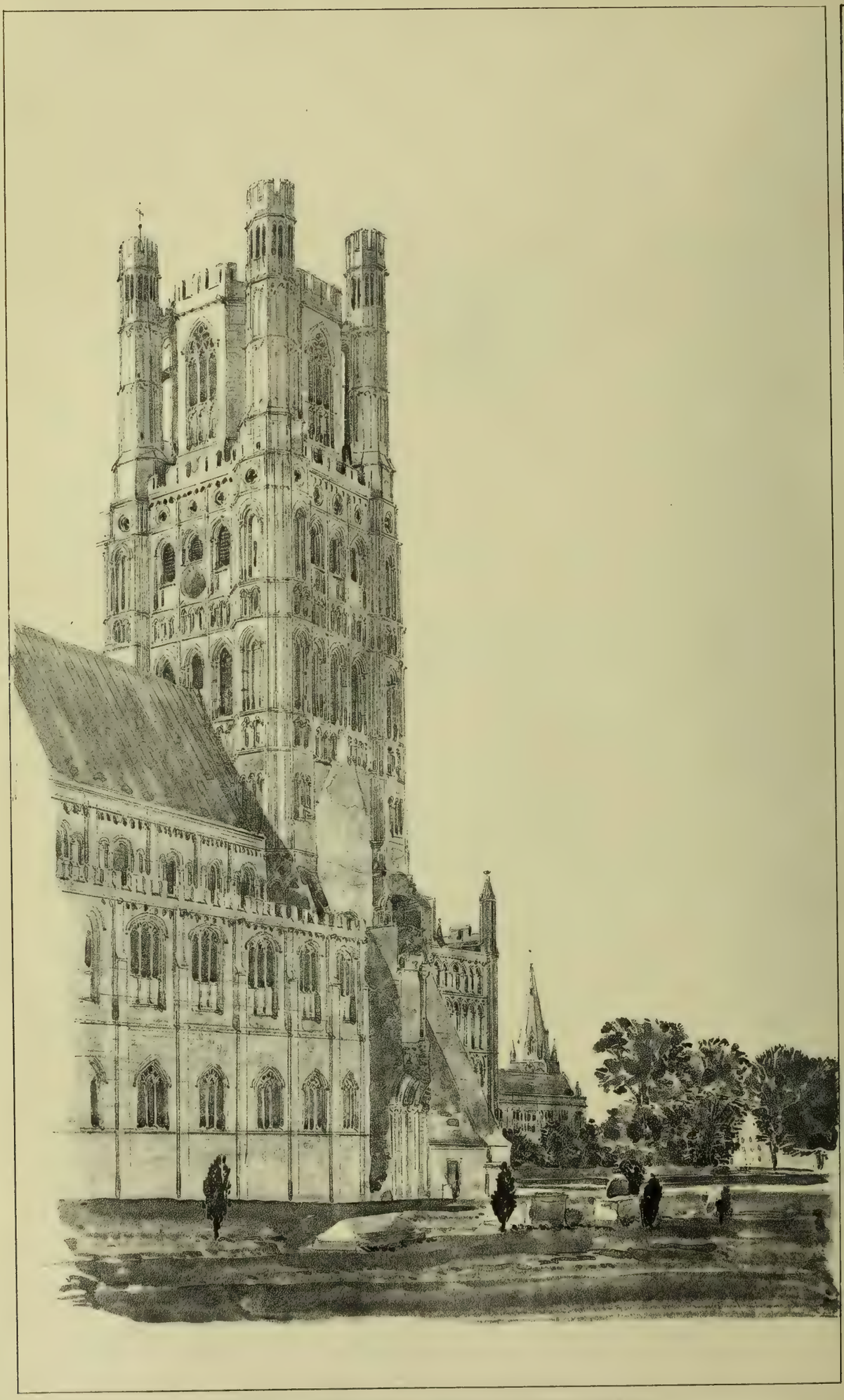
Sage and Co.	£369 0 0
Colls, G.	350 0 0
Wall Bros.	331 0 0
Drew and Cadman (accepted.)	318 0 0

London.—For the erection of additional stabling for 40 horses, for Messrs. Carter, Paterson, and Co. Ltd., at their depot, Church-street, Stoke Newington, under the superintendence of Mr. W. Eve, Union-court, Old Broad-street, E.C.:—

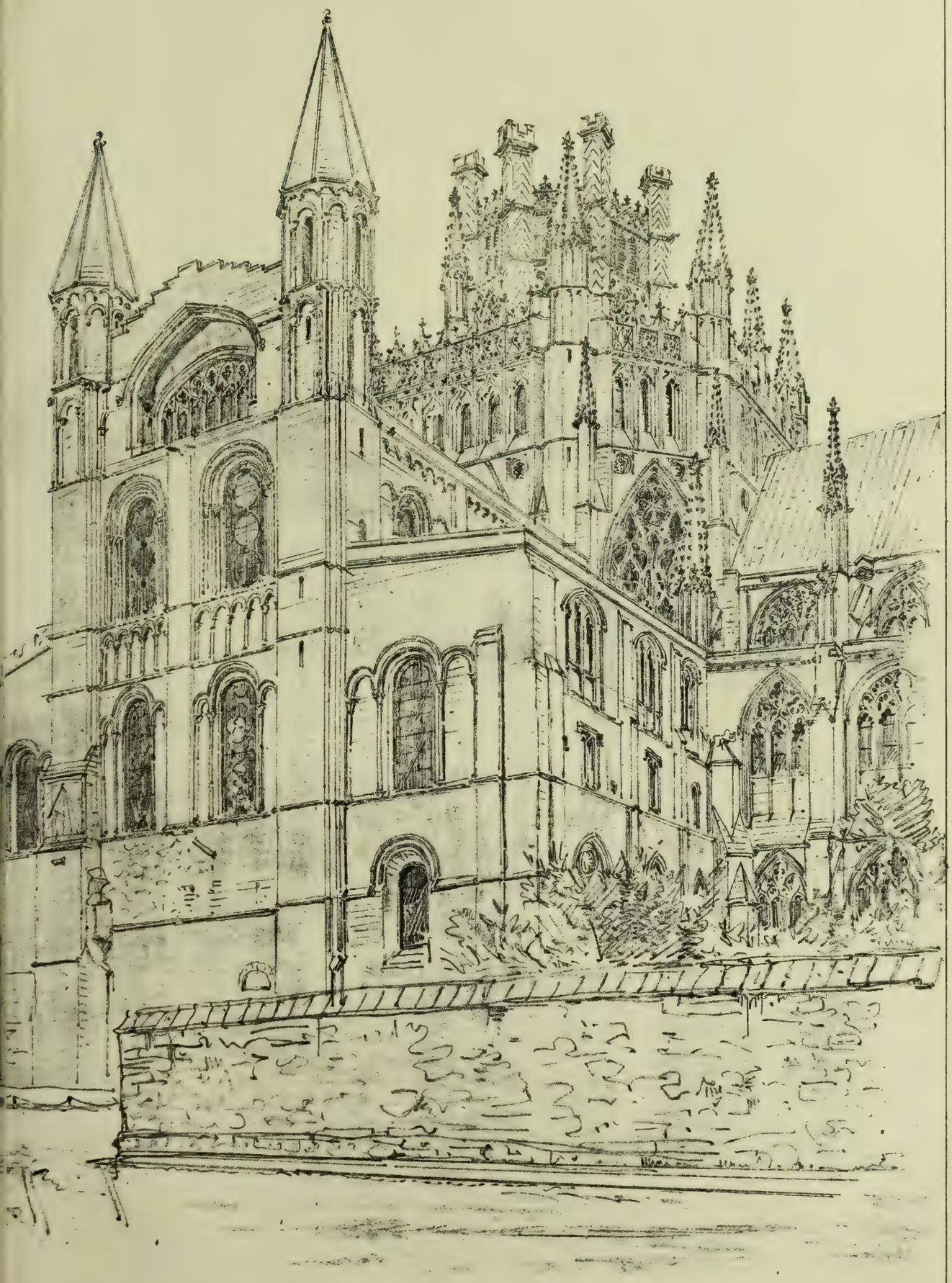
Chappell	£1,546 0 0
Adamson	1,470 0 0
Chessum	1,460 0 0
Harris and Wardrop	1,444 0 0
Downs	1,419 0 0
Holiday and Greenwood	1,398 0 0
Dabbs	1,397 0 0
Holland	1,375 0 0
Burman	1,300 0 0
Johnson	1,289 0 0
Higgs	1,260 0 0
Godfrey and Son, Evering Works, Clapton (accepted)	1,190 0 0

London.—For the erection of St. Martin-in-the-Fields Free Library, in St. Martin's-lane, for the Library Commissioners. Mr. R. Walker, F.R.I.B.A., 33, King-street, Covent-garden, architect. Quantities supplied by Messrs. H. J. Northcroft, Son, and Neighbour:—

Balaam Bros.	£7,600 0 0
Perry and Co.	7,359 0 0
Kirk and Randall	7,350 0 0
Garlick and Horton	7,221 0 0
Mowlem and Co.	7,186 0 0
Pattinson, S. and W.	7,146 0 0
Lobb and Olver	7,126 0 0
Hockley and Son	7,100 0 0
Brass and Son	6,877 0 0
Stephens and Bastow	6,877 0 0
Toms, E.	6,863 0 0
Chappell, J. T.	6,861 0 0
Allen and Son	6,825 0 0
Peto Bros.	6,769 0 0



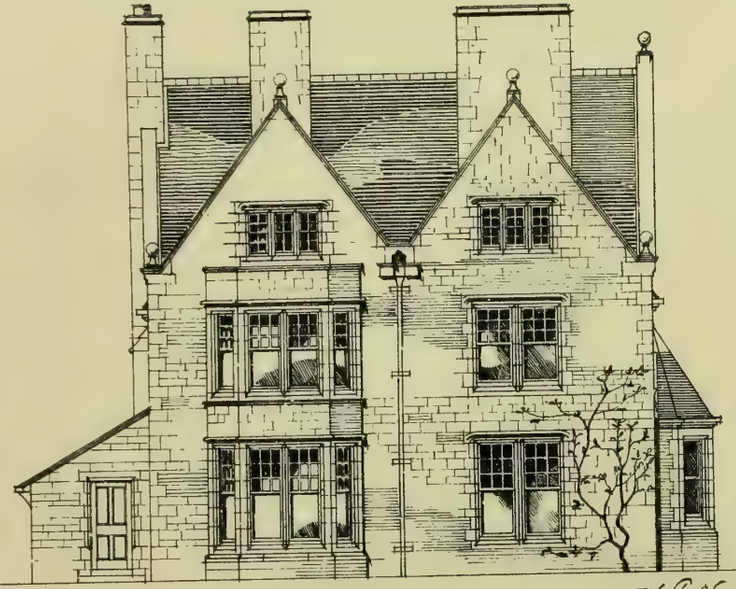
WESTERN TOWER FROM THE NORTH-EAST



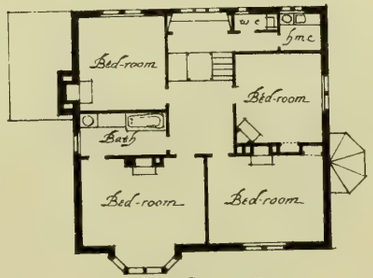
VIEW OF THE OCTAGON

"PHOTO-TINT," by James Akerman, 6 Queen Square London W.C.

thes. by J. Johnson, Arch.t



West Elevation

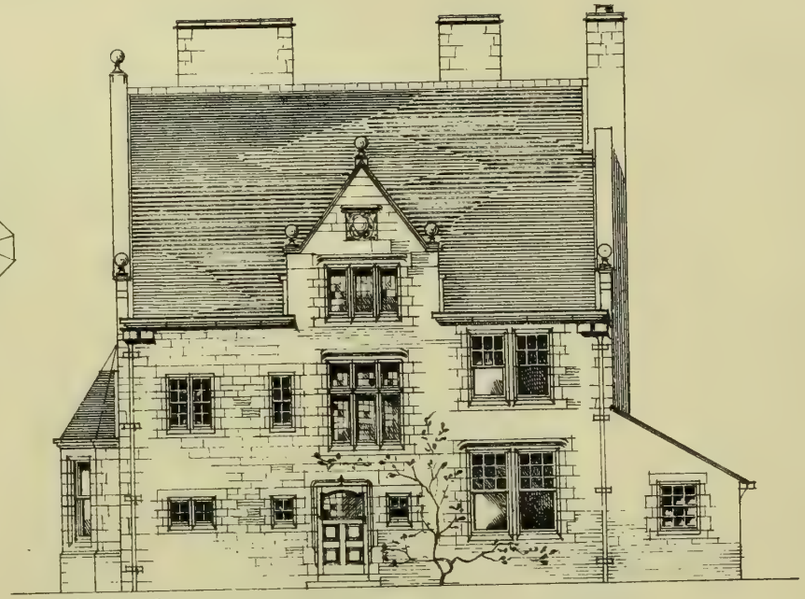


The first floor plan

St. George's Parsonage

HALIFAX

Bell and Koper
Architects.



East Elevation



North Elevation

The Ground plan

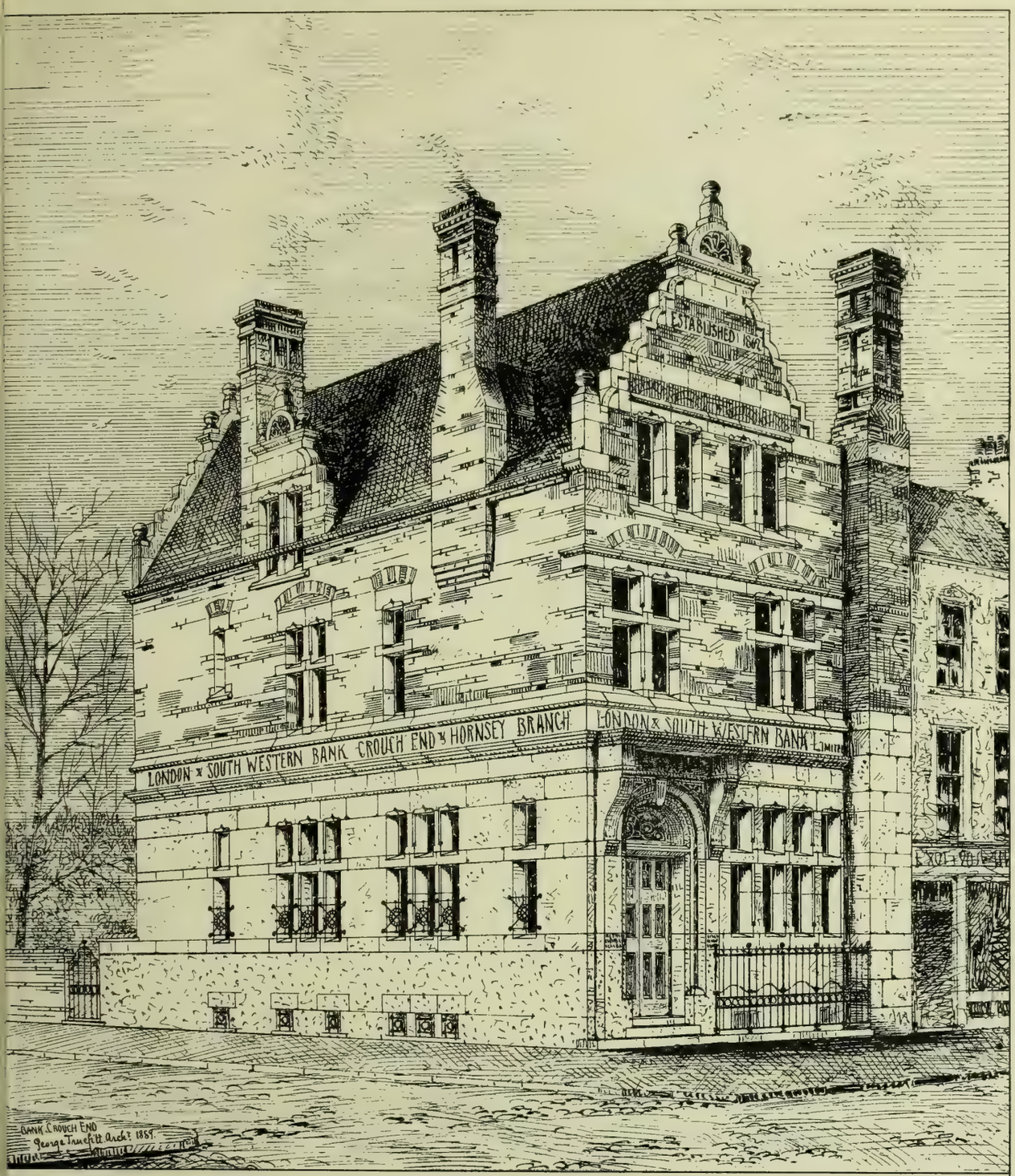
St. Peter's Vicarage

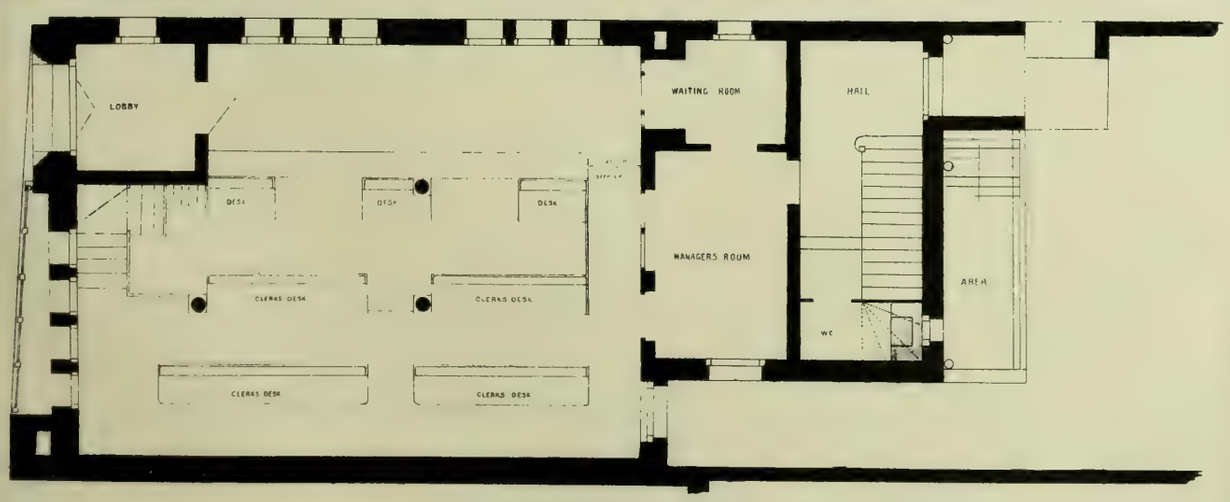
AINTREE.



East Elevation

Photo Lithographed & Printed by James Akerman, 6 Queen Square, W.C.

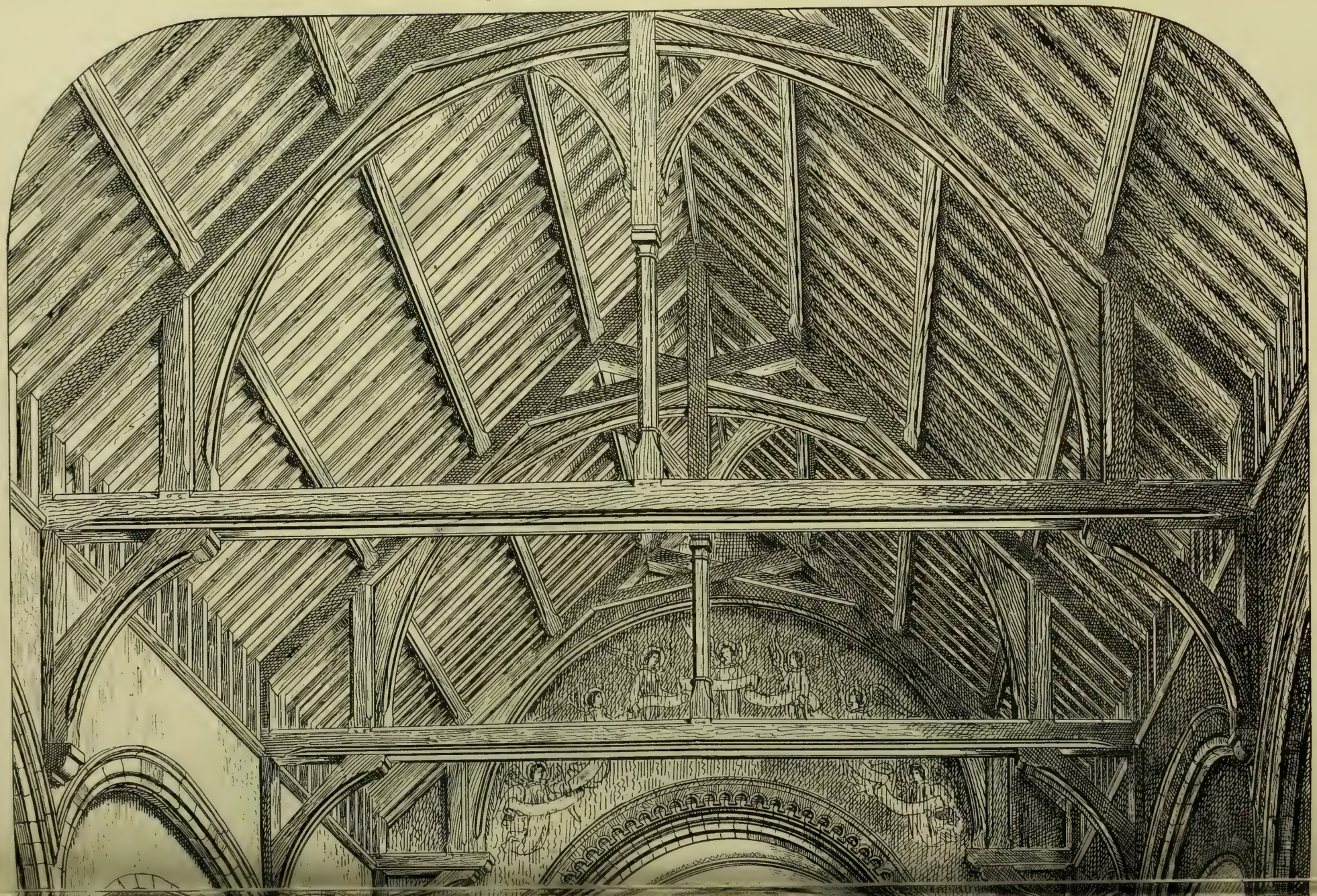


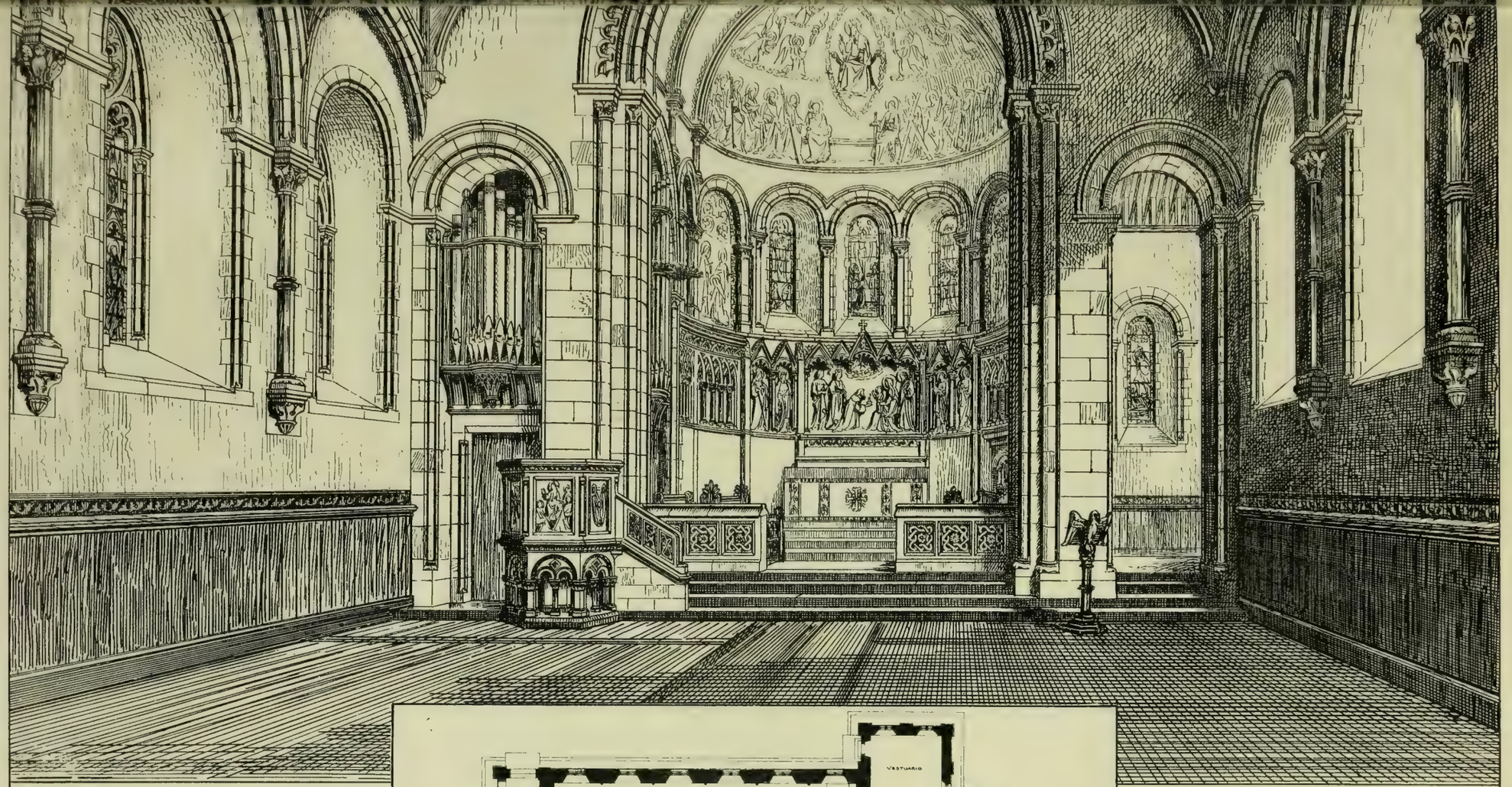


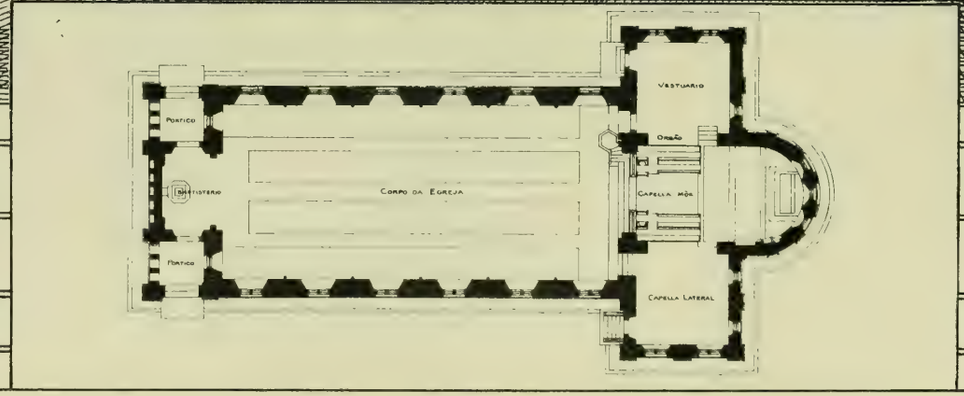
GROUND FLOOR PLAN

L & S.W. BANK · LIMITED · CROUCH-END-BRANCH · G. TRUEFITT · ARCH.T

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.







NEW·ENGLISH·CHURCH

— LISBON —

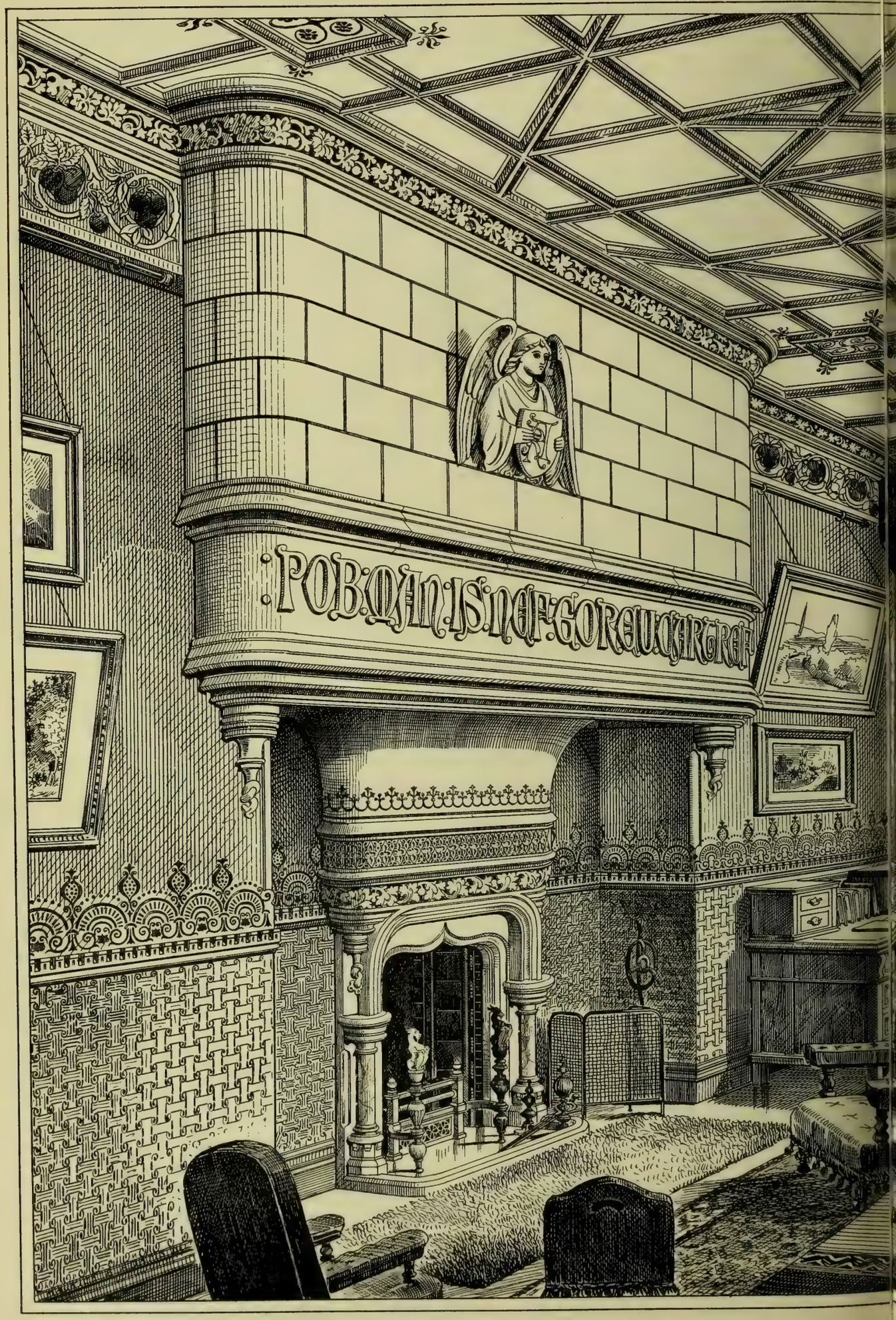
MEDLAND & POWELL

OF·SAINT·GEORGE:

— INTERIOR·VIEW —

ARCHITECTS · LONDON

Photo-Lithographed & Printed by James Akerman, 6 Queen Square W.C.


POB MAN IS NOT GOREUCHRTOF



THE

DINING ROOM,

TY-TO-MEAN

ST MELLONS

E.M. Bruce Vaughan A.R.I.B.A.

Architect.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1809.
FRIDAY, SEPTEMBER 6, 1889.

RECENT IMPROVEMENTS IN THE METROPOLIS.

OUR Metropolitan highways and by-streets are one after another undergoing the process of change—widening here, straightening there; the effect of the changes being to make the "crooked paths straight," and to throw more open space into the thoroughfares. A visitor to the Metropolis twenty years ago, who had a good memory, and had carefully observed what he saw, would now, if he paid a visit, find considerable alterations: in a few localities he would see a complete transformation—street after street removed, well known landmarks gone, and a new arrangement of houses and streets to have taken their place. Northwards of Charing-cross he would notice such a transformation. He would find a wide and newly-built road stretching from the back of the National Gallery all the way to Oxford-street, instead of the tortuous route through Seven Dials, through purlieus which were always unsavoury, though perhaps less distasteful in associations. A little further to the west he would discover that Piccadilly-circus, another well-known centre, had disappeared in all but its name. The circus, indeed, only exists in part, while the rest is a wide "oasis" of paving stones and roadways of no particular form, but very chaotic and bewildering. Proceeding westwards along Piccadilly, the visitor would notice a great change at Hyde-park Corner,—the Wellington statue, which formerly stood opposite the gateway leading into the park removed, and a large triangular area with islands of pavement in its place, while the gateway is placed at the entrance to Constitution-hill. There is a wider space for traffic, but the architectural relation of the two gateways is not improved. Travelling up Knightsbridge, he would find the boundaries of the park near Albert-gate somewhat changed by the erection of gigantic blocks, the Horticultural Gardens or Exhibition site covered by scaffoldings and new buildings, and lofty buildings of red brick, monotonous in their colour and outline, erected along the once picturesque thoroughfare of Brompton and Fulham-roads. In the more central part of the Metropolis, the changes would be found of greater extent. South of Charing Cross a stately row of palatial club-houses and hotels lead the way from the square to the Victoria Embankment, the whole curved thoroughfare of which forms a line of dignified buildings from Westminster to Blackfriars Bridge, accomplished under the Thames Embankment Acts. Another great artery of traffic has undergone important changes during the period we have mentioned. The widening of Gray's Inn-road, and the thoroughfares which lead out of Holborn Circus, notably Holborn-viaduct, Farringdon-road, Theobald's-road, and Clerkenwell have made one continuous thoroughfare to the east end. In the neighbourhood of St. Paul's the streets are being widened, and Ludgate-hill—a little while ago a narrow street—is nearly wholly rebuilt on the south side, while Queen Victoria-street carries the southern line of the Embankment to the heart of the City, and is lined by imposing warehouses. Within the bounds of the City the changes have been chiefly confined to straightening, here and there widening, and in rebuilding old premises. Fenchurch-street, Gracechurch-street, Cornhill, have almost been transformed architecturally, and the neighbourhood of London Bridge has put on quite a new aspect with the completion of the line of street from Cannon-street to the Tower. Innumerable have been the changes made in the outer portions of the Metropolis under the Metropolitan Street Improvements Act 1877. The operation of these Acts has altered the appearance of roads near the Angel, Islington; the main thoroughfare through the picturesque suburbs of Camberwell and Peckham; whilst the widening of these roads, and others at Walworth-road, Hammersmith, and Bermondsey, have given a fresh impetus to building in the suburbs.

Instead of the crooked lines which bounded the old buildings, the new frontages are straight, the houses have in all cases been built higher; but of architectural interest they have little. The lines have been partially set back here and there; but the extra height to which the houses are carried has robbed the locality of any benefit accruing from widened roadways. The Act to have benefitted the public should have limited the height of the building, and in other ways controlled the design of the elevations. But Acts of Parliament only prescribe lines so far back and allow builders to put up what they please. It is a rough and ready rule, which takes no time in committee, and is as easily set out on the ground. Thus, alike at Hammersmith and Camberwell, all variety and architectural design have been sacrificed to routine and red tape.

We now notice a few of the sites in the City where alterations are being made, and the first of any importance is that in the west side of the Law Courts. Two important groups of buildings are here in connection—the Law Courts and Clement's Inn—separated by a triangular area of land, which has recently been turned into a grass plot, facing the west front of the Courts and the buildings of Clements' Inn. On the north side of this open area stood Grange-court and old and dilapidated rows of houses fronting Yates-court, a narrow passage-way in a line with Carey-street and New Inn. This old block has been removed and excavations are being carried on preparatory to laying the foundation of the new Bankruptcy Court. It is a pity this site could not have been added to the plot of ground left open at the side of the Law Courts, as it would have been a valuable space in front of King's College Hospital, which adjoins it northwards. The front of the proposed building will, no doubt, be designed to agree with the flank elevation of the Law Courts and the red brick block of chambers in Carey-street, and its position ought to claim for it a design worthy of the surroundings. At present the south front of the hospital, a heavy-outlined and unprepossessing building, is exposed to Fleet-street. Those who admire spacious squares or *p'azas* will note the possibilities of this site—how it might have been arranged if the Law Courts could have been placed elsewhere, and what a great central garden might have been planned here as an oasis amidst a desert of bricks and mortar. Not that the Italo-Geometrical style of town planning is the most pleasing; the ideal of great squares surrounded by stately houses, central gardens, and terraces has been tried and found wanting. In some parts of Bloomsbury and the West-end this style of town arrangement has existed; but the English love the old-fashioned, the picturesque, and the homely. There is a coldness and bareness in a London square surrounded by mansions and planted as a garden, even though the Classic accompaniments of fountains and pavilions, parterres, and terrace-walks are introduced. In Paris only is this ideal of civic architecture tolerable; but then it was the aim of the First Napoleon, as of the last, to copy the City of the Cæsars in all its splendid completeness. London, moreover, has not had the opportunities of its gay sister. Except the Great Fire, when something worthy could have been accomplished, public improvements have given way to private interests, and have been undertaken in a cheeseparing piecemeal way. When the demolitions of old houses commenced in different parts of London there were opportunities; but these are lost.

Associations are strong also. The enthusiasm with which Gothic was hailed as a popular style some years ago, and the desire to preserve the older parts of the City have entirely prevented the introduction of the Continental *place*, *plaza*, or *piazza*, only suitable to Classic buildings. But we do not need it so much, after all, with our parks and embankments. It is the irregularity of our streets which has discouraged regular or Italian architecture, and any sort of balanced composition, and we have to keep this fact in view in estimating the architecture of our thoroughfares. Two species of brick Gothic of unequal merit are to be seen near the Law Courts. Clement's Inn is a very mechanical sort of Venetian; but Mr. Waterhouse's chambers in Carey-street is a thoroughly modern adaptation in red brick, which contrasts strongly with the larger stone building in front. It is even more strange to find these three different manifestations of Gothic. The whole site from Clement's Inn to Bell Yard was a grand one for the architect; the present surroundings are certainly not flattering, or equal to the occasion of setting-off one of the largest buildings in the Metropolis. The recently erected bank, by Sir A. W. Blomfield in Fleet-street, is a departure from the Mediæval-looking block, and one of the few modern Italian edifices; its end towers boldly stop the facade and break the sky line, which otherwise would have been abruptly terminated by the lofty clock-tower of the Courts. By recessing the front of the bank between the advanced towers at the ends of façade, great solidity of character is obtained—a feature which might have been secured in other public buildings in our leading thoroughfares if their architects had given up a few feet of depth in one portion of the façade. Standing between Bell-court and Chancery-lane the projecting towers are significant and give size. More than this, the western one conceals the bare and unsightly side of the clock-tower of the Courts, in the view looking westward from Fleet-street. On the opposite side of the street, at Colonel Edis's Legal and General Life Office, of terra-cotta and brick, a similar setting back, though to a less extent, is observed. One of the most agreeable diversions from the straight line is afforded by the curved bend of the houses round St. Clement Danes in the Strand—a plan that, if it had been followed round the church of St. Mary in the Strand, would have disarmed the opposition which threatens to remove that fabric, now once more in course of re-restoration, this time under Mr. MacVicar Anderson's direction.

The widening of Ludgate-hill is an important undertaking of the City Commissioners of Sewers, and has advanced to Creed-lane on the south side. There has been a rumour about taking down St. Martin's Church on the opposite side; but we hope that nothing so wanton will be sanctioned, as the picturesque "spire steeple" as Strype calls the tower, is one of the most pleasing structures of its class, and considerably helps to give scale and interest to the cathedral in the background—a feature, too, which the artist of the locality has highly valued in making it group with the more rotund mass of the dome. In these views the little spire and its gallery come out in strong relief against the grey tint of the cathedral. Nor is there any need for removing the old structure. The contemplated widening of Old Bailey does not interfere with the church, which is farther eastward. As to enlarging St. Paul's

Churchyard by throwing in a portion of the area covered by the old buildings at the east end of Ludgate-hill, this might be done; but a strong argument was put forth some time ago, when the subject was debated, for leaving the area round St. Paul's as it is, namely that the partial view of the edifice seen between dark-shadowed masses of buildings is more pleasing and picturesque than if the whole front were immediately disclosed to view. A glimpse of a great building is more impressive and considerably more awakening of emotion than a full view of it in a large inclosure. These are considerations of an artistic kind which do not come into the deliberations of public bodies, who regard them as sentimental and trivial instead of unerring laws. As a public convenience the widening of Ludgate-hill has long been called for, so is the widening of a great many other thoroughfares; but it must not be overlooked that there is another side to the question. By widening a street at one end or juncture a much larger number of vehicles will be admitted into it at that point, and unless the other portions of the street are equally widened, the evil of a stoppage of traffic is rendered more formidable than before. There are many instances of this in London where the streets vary in width. The principle to be remembered in dealing with large currents of traffic, like that of the passage of water in a conduit, is that the efficient width of a roadway is only that of its smallest dimension. We reserve for a future notice some further remarks on the architecture and improvements in the City.

LEVELLING.—XVIII.

TAKING THE ANGLES OF SLOPES BY CLINOMETER.

WE promised in our last article to explain the construction and mode of using the clinometer in obtaining the angle of slope on a hillside for the purpose of calculating the horizontal distance. Referring again to Fig. 36, p. 245, where we have supposed a levelling instrument set up between the two staves A and B, it may be observed that the difference of level between them, found by subtracting the back-sight A from the fore-sight B, can be only of use in making a section of the ground when the distance between the two staves is known, for which object the horizontal distance must be chained. The method adopted for short distances on steep slopes is for the leader to hold up the chain as nearly level as possible, and to use a small plumb-bob in fixing his arrow in the ground; but for long inclinations the chainage is taken along the slope, and afterwards reduced to horizontal measurement. We will suppose the distance is chained along the ground in the usual way, and the angle of slope is taken, which may be done by any angular instrument, or even a jointed rule with one leg of the rule held quite level and the other directed to the further staff at a point or crosspiece exactly the height of the surveyor's eye. The surveyor stands at A, his height being previously marked on staff B, and he sights the mark with one leg of rule, while the upper one is held quite level. The vertical angle is then noted, and the correction made by which the horizontal distance is accurately determined. For the purpose of observation, a jointed rule should be fitted with a vertical graduated arc and a spirit level. An instrument answering this description has been invented and is sold under the name of a clinometer rule (Fig. 40), one of the simplest and most compact instruments for the purpose of the surveyor. The rule is made of boxwood jointed by a rule-joint, the arms about 6in. long each. On the edge of both arms a spirit-level is inserted, as shown in our sketch, while at the ends of the upper arm sights are hinged with cross wires. A brass quadrant, divided into 90 degrees and minutes, measures the opening of the rule to any required angle. Placing the lower arm level, the upper arm can be directed to a point on a staff sent forward up a slope or hill, and the angle measured (see Fig. 37). When a declivity has to be taken, the eye is placed at the other end of upper arm and directed to a point downwards, so that either sight can be used as most convenient. For enabling the correction to be made at once, a table of hypothenusal allowances is engraved on one side, as shown in our sketch, and a small compass is sunk in one side of the lower arm. Thus, if the angle of inclination measures 17°, the difference between the hypothenusal and horizontal measurement is 04·4 links; if 26°, the difference is

Fig. 37



Fig. 38

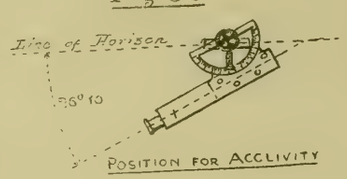


Fig. 39

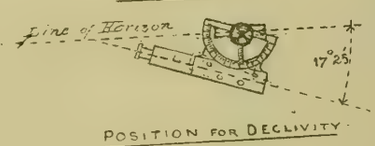
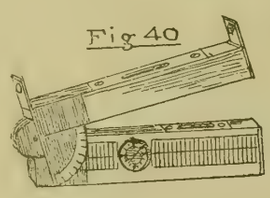


Fig. 40



10·1 links. There is a more complete and perfect instrument (the Abney level, made by Elliott) sold, which combines a reflecting level with the clinometer, and is highly valued by surveyors, who can use it for rough levelling operations without a stand, it being a pocket instrument about 6in. long. The bubble of the spirit-level is reflected by a prism so as to be seen in the field of the telescope, which is attached to the half-circle and revolves on an axis. Figs. 37, 38, and 39 represent the Abney level in the positions for taking angles, either acclivities or declivities. The telescope, or lower arm, has a vertical arc fixed to it, each quadrant of which is divided into 60° and minutes. Pivoted to this arc is a small spirit level, actuated by a small wheel, the bubble of which is reflected on a diagonal mirror and can be seen in looking through the telescope. A vernier fixed to spindle and at right angles to the level enables the angles to be read with accuracy, the observation being correct when the bubble is coincident with the horizontal line of the mirror. The level being adjusted horizontally by the small wheel, the telescope is directed to the point, or staff, either upwards in the case of an acclivity, Fig. 38, or downwards in the case of a declivity, Fig. 39; the eyepiece being in the one case at the lower end of the telescope, and in the other case at the upper end, as in Fig. 39. The vernier arm is always vertical, so that its distance from the zero point of the arc records the angle. A light tripod is sometimes used to rest the instrument when accurate readings are required. The surveyor can readily adjust the Abney to any angle without fear of inaccuracy, as his observation depends on the adjustment of the line of sight to the level or line of horizon; the principle of the instrument being the same as that used for taking horizontal angles where the mirror is introduced. The reflecting clinometer of Troughton and Simms is a modification of the Abney in some small detail, and is a stronger and perhaps more readily adjusted, the arc resting on a triangular frame attached to the telescope, and is actuated by a screw. Another instrument is the compass clinometer, a combination of the prismatic compass and clinometer—a portable instrument that can easily be changed from horizontal to vertical angle reading; but our object is not to describe or recommend instruments, which can be obtained at Messrs. Stanley and other respectable surveying instrument-makers.

It will be observed that it makes no difference in the angle whether it be taken down or up a slope, as by Euc. I. 29, the oblique line of sight makes, with the horizontal line, the same angle. When the slope of a hill is of varying inclinations, each inclination must form a separate angle; thus, the first inclination to a given point may be 15°, the next 12°, the next 20°, each of which angles with the horizon must be taken with the hypothenusal distance between. The correction for every angle of slope can be made in the chainage as it proceeds. Thus, the rise of a hill is 20°, and the distance is 16·14 chains, after which the rise is 11·30, and the distance is 5 chains. Here the reduction for the first angle is 6·03, and that for the second 2·01; or:

16·14 × 6·03 = 97·3242 links
5·00 × 2·01 = 10·05

107·3742 = 107 links = 1·07 chains.

Therefore, adding the slope distances 16·14 chains, and 5 chains = 21·14 chains, and subtracting 1·07 leaves 20·07 as the horizontal distance. The rule is therefore simply to multiply the distance measured at every rise or fall by the reduction found in the table corresponding to the angle, and subtract the product from the total distance. The reduction, as we have said, can be made as the chaining proceeds, by moving the arrow the required distance each time one is put in the ground at the end of each chain, a plan which avoids all after-calculation, the only thing necessary being to find out the necessary allowance for the angle of slope. We, however, prefer the method of "stepping" the chain in those cases where great accuracy is not required.

HOUSE DRAINAGE IN LONDON.

THE correspondence columns of the *Times* are occupied this week with a discussion on House Drainage in London, started by Mr. Edward Tidman, M.S.A., who pointed out that owing to the entire absence of any legal regulations or supervision the jobbing builder and so-called sanitary engineer do just as they like, with results that might be expected. The omission on the part of the late Metropolitan Board of Works to prepare regulations as to drainage under the powers conferred on them by their first Act of 1855, has not yet been attempted to be remedied by their successors, the Lond

County Council, although they have been appealed to and memorialised on the subject. There is not, Mr. Tidman declares, one vestry in London, except, perhaps, Kensington, that takes effective steps to advance with the times and properly superintend the drainage and fittings of houses, but even Kensington is hampered in its usefulness from the entire absence of proper legal power to compel the landlords to put their houses in good sanitary condition. As to St. George's, Hanover-square, notwithstanding the vaunted healthy state of the parish, according to the report of Dr. Corfield, the medical officer of health, Dr. Tidman asserts that there is no district in the metropolis where, to his knowledge, a more leaky, rotten, and disgraceful system of house drains exists than in that parish. Mr. Charles W. Millar, F.S.I., corroborates Mr. Tidman's statements as the scandalous and defective drainage of houses in every part of London, and urges that the question of how to deal with the foul gases accumulating in main sewers should be grappled with by the County Council or the parochial authorities. Mr. J. Standish Haly remarks that another cause of nuisance in West-end districts is the arrangements for emptying dustbins; these receptacles are left to accumulate rubbish throughout the "season," and are now being emptied at all hours of the day. Mr. Arthur Clay points out that another fertile source of nuisance in the West-end is the practice of burning dustbin refuse from Kensington and Hammersmith as fuel for brickmaking at the Notting-hill brickfields—a nuisance not confined to the western suburbs of the Metropolis. Mr. F. Wootton Isaacson, M.P., states that since he asked the President of the Local Government Board to adopt some remedy to insure the sanitary conditions of houses in the Metropolis he has received upwards of three hundred letters on the subject. He intends next session to bring in a Bill making it illegal for house agents or anyone else to let or sell houses, &c., unless a certificate is produced, furnished by a Government inspector, notifying that the premises are in a perfectly sanitary condition and fit for occupation.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—LII.

By HENRY LOVEGROVE, F.S.I., Surveyor.

A VILLAGE ELEMENTARY SCHOOL.

DRAINAGE.—INSPECTION CHAMBERS.

Ft. in.	Ft. in.		
2 6 × 2 0			In clear.
5 0			
4 6			
1 0	22	6	Dig and cart and concrete.
5 0			
4 6			
1 9	39	5	Dig and cart, a part filled in and rammed.
12 0			
1 6	18	0	1 B. wall in cement.
9 0			
1 6	13	6	Portland cement rendering inside.
2 6			
2 0	5	0	Do., but dished to form bottom.
			1 6in. Glazed white stoneware circular channel and setting in concrete.
2 6			Ex. labour dishing concrete to form
2 0	5	0	bottom to inspection chamber.
11 0			6 by 4 York stone tooled rebated curb, bedded and jointed in cement.
			1. 2in. tooled York stone, moveable cover, with tooled eges, 2ft. 9in. by 2ft. 3in.
			2 wrought-iron flush-rings 2½in. diameter let into York stone and run with lead.

INSPECTION CHAMBER, 3ft. 3in. by 2ft. 9in.

5 9			
5 3			
1 0	30	2	Dig and cart and concrete.
5 0			
5 3			
2 0	60	4	Dig and cart, a part filled in and rammed.
15 0			
1 9	26	3	1 B. in cement wall.
12 0			
1 9	21	0	Portland cement rendering inside.
3 3			
2 9	8	11	Do., but dished to form bottom.
			1 6in. glazed white stoneware circular channel, about 5in. girth, and setting in concrete.
3 3			Extra labour dishing concrete to
2 9	8	11	form bottom to inspection chamber as before.
14 0			6 by 4 York stone, tooled curb as before.
			1 2in. tooled York stone cover, as before, but 3ft. 6in. by 3ft.
			2 Wrought-iron flush-rings, as before.

MANHOLE, 3ft. by 2ft. 6in.

Ft. in.	Ft. in.		
5 6			
5 0			
1 0	27	6	Dig cart and concrete.
5 6			
5 0			Dig and cart a part filled in and
2 0	55	0	rammed.
14 0			
1 9	24	6	1 B. wall in cement.
11 0			
1 9	19	3	Portland cement rendering inside.
3 0			
2 6	7	6	Do., but dished as before.
			1 9in. glazed white stoneware channel 3ft. long, with branch and setting in concrete.
3 0			Extra labour dishing concrete, as
2 6	7	6	before.
13 0			6 by 4 York stone tooled curb, as before.
			3 Dyer's iron airtight doors, p.c. 30s. and fixing.
14 0			14in. Doulton's glazed stoneware drain-pipe in cement, &c., and digging, average 2ft. 6in. deep.
			1 4in. junction, extra to.
			2 extra to 4in. bends.
			1 end 4in. drain-pipe built through 9in. wall, and making good thereto.
14 0			Add.
			1 extra to bend.
			1 drain interception trap. Hillyer's patent, and fixing.
80 0			6in. Doulton's glazed stoneware drain-pipe, and digging, as before.
			2 ends 6in. drain-pipe, built through 9in. wall, as before.
18 0			4in. Doulton's drain-pipe, as before.
			1 extra to bend.
			1 drain interception-trap, as before.
			1 end 4in. pipe, made good, &c., to brick wall, as before.
18 0			4in. Doulton's pipe, as before.
			1 end 4in. pipe, made good.
			3 extra to junctions.
			4 extra to bends.
54 0			9in. Doulton's glazed stoneware pipe, and digging, as before.
			2 ends made good to brick wall, as before.
12 0			4in. Doulton's glazed stoneware pipe and digging as before as ventilator.
			1 end made good to brick wall.
			1 extra to bend.
5 0			4in. cast-iron ventilating pipe, with joints caulked with red-lead and tow.
			1 galvanised iron inlet, with mica flap and fixing to 4in. pipe.
74 0			
			4in. Doulton's drain-pipe and digging, as before.
4 2 0	8		Add.
			4 extra to 4in. bends.
			4 Doulton's 8in. glazed stoneware yard gullies with iron gratings and 4 outlet bedded in concrete.
			Provide 50ft. 9in. glazed stoneware pipe jointed in cement, and deep digging or tunnelling to connect with sewer.
			1 9in. Pt. sewer gas interceptor, with cleaning arm.
			1 connecting 9in. pipe drain to public sewer.
			Allow for paying all fees legally demanded by local authorities.

SPECIFICATION—(*continued*).

JOINER—(*continued*).

57. *Jamb Linings.*—The internal doors, where solid frames are not shown, to have 1½in. double rebated jamb linings and backings. All doors and windows to have ¾in. framed grounds splayed for plaster.

58. *Screens.*—The screens between school and classrooms to have in the lower portions 2in. deal moulded both sides, four panels high, as detail drawings, to run on Hatfield's patent roller sheaves on wrought-iron knees on each side, screwed to floor and post, and let in flush.

The upper portions to be 2in. sashes, filled in with extra stout bars to form small squares. Deal mouldings as shown on both sides of screens, 1¼ linings to form jambs, and 4in. by 3in. frames.

59. *Hat and Coat Rails.*—The hat and coat rails 4 by 2, framed with 4 by 4 posts in three rails, and on the walls of cloak-rooms 4 by 1 deal double-beaded rails plugged to wall, and on the two kinds of rails fix about 1ft. apart No. 400 japanned double hat and coat hooks of approved pattern.

60. *Stairs.*—The stairs to have 1½in. treads, with rounded nosings, 1in. risers, glued, blocked, and bracketed on strong fir carriages, 1½in. beaded strings, with 3 by 2 moulded capping, 1½in. turned balusters, 4 by 3½ moulded oak handrail, the newels to be 4 by 4, with turned oak cap 6 by 6 and 18in. long, the skirtings on landings to match the strings, the nosing to be carried round landing with ¾in. apron lining.

61. *Materials.*—The whole of the wrought and cast iron to be of the best quality.

62. *Other Trades.*—Supply the necessary bolts and other ironwork required for carpenter and other trades.

63. *Eaves Gutters.*—All eaves to have 4 by 3 moulded eaves gutters, properly bolted and jointed in red-lead cement, and fixed with strong screws, with all necessary angles, stopped ends, &c., and all outlets cast on and fitted with galvanised-iron domical wire gratings.

64. *Down Pipes.*—All down pipes to be 4 by 3 square, with ornamented ears, and holder bats properly fixed to stone facings.

65. *Stanchions.*—The four stanchions from ground floor up to roof to be as detail of 1½ cast iron, with top-plate and base and proper stiffening pieces, the upper stanchions to be bolted to the lower with four ¾in. bolts to each stanchion.

66. *Girders.*—At the level of first floor, and to carry roof, fix two girders running across from wall to wall, the ends over stanchions to be secured by ¾in. fishplates bolted with ¾in. bolts, the girders to be 12 by 6, weighing 56lb. per foot, blocked out with fir to the proper thickness.

67. *Grates.*—All fireplaces to be fitted with Dr. Teale's patent grates, set in the best manner.

68. *Bell.*—Provide and hang where directed to ring from ground floor, a bell 18in. diameter, from Messrs. Warner, of good tone, with the necessary fittings and gear with ¾in. strong galvanised chain and rope.

PLASTERER.

69. *Materials.*—The laths to be those known as lath-and-a-half of the best Baltic fir, to be butted at the joints and nailed with galvanised-iron nails.

70. *Lime.*—The lime to be fresh, well-burnt chalk-lime, to be run into putty at least one month before being used.

71. *Sand.*—The sand to be clear, sharp, river sand.

72. *Hair.*—The hair to be sound, long black hair, well beaten.

73. *Distemper.*—The plastered walls to be distempered of approved tints.

74. *Ceilings.*—Lath, plaster, float, and set ceilings throughout, and twice whiten same.

75. *Walls.*—The walls above dado to be rendered, floated, and set.

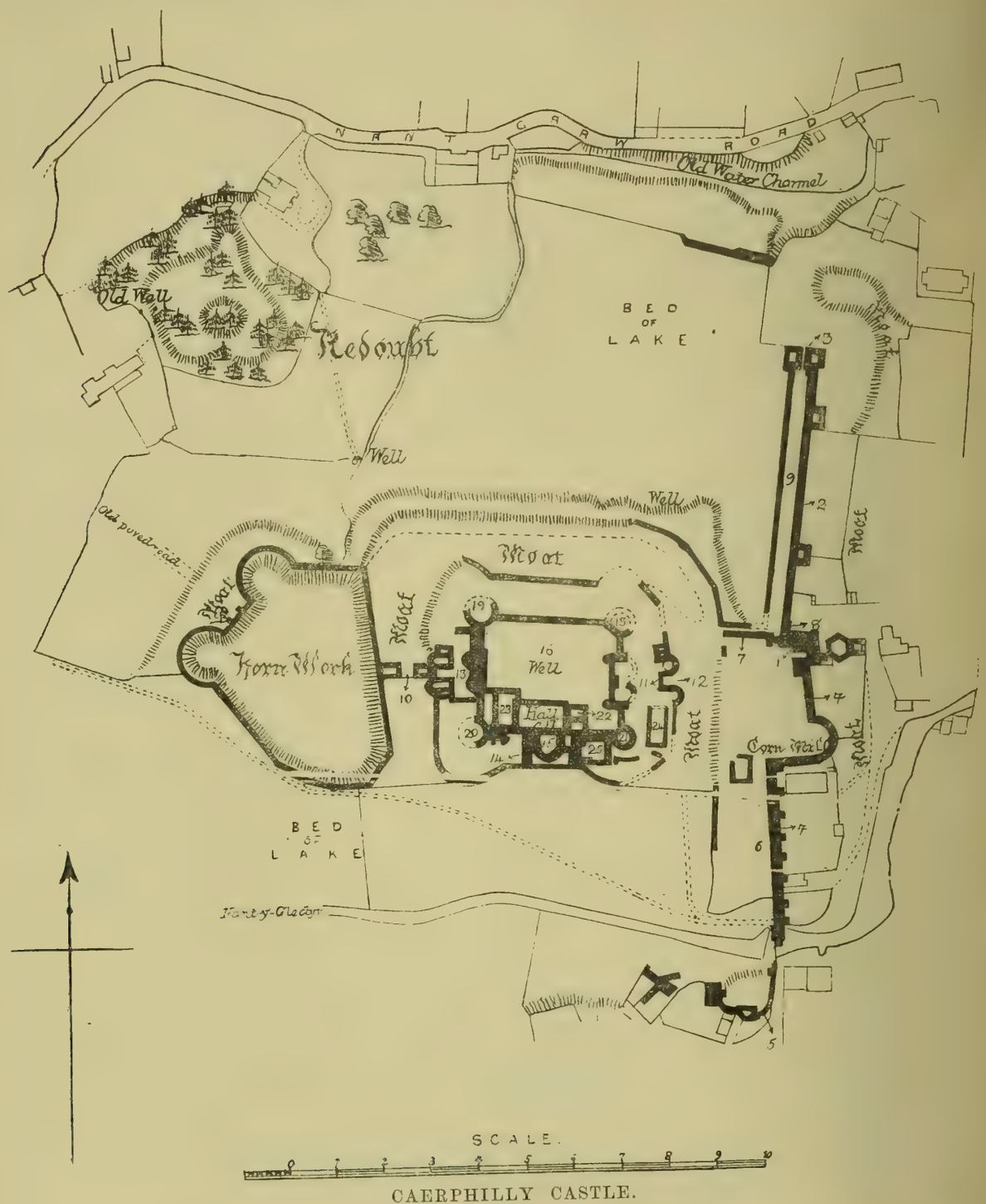
76. *Angles.*—Angles to be in Keene's cement.

THE VISIT OF THE SOCIETY OF ARCHITECTS TO CARDIFF.

THE third annual provincial congress of the Society of Architects, which terminated on Friday night, has been the most successful yet held, and exceeded in warmth of reception, in numbers, and above all in interest, those which have previously taken place. The absence of Mr. H. R. Gough, owing to illness, of Messrs. W. H. Seth-Smith and E. Farman and others, who are abroad, was regretted; but Mr. Robert Walker proved a genial, ubiquitous, and popular president, and gained the society and the cause of Registration many supporters and well-wishers.

We give first: 1. A plan and reference of Caerphilly Castle, for the greater part compiled from "The Work on Military Architecture," by Mr. G. T. Clark. This should have accompanied the report in last week's issue, but was not engraved in time.

Taking up the threads of our report of the congress at the point where they were dropped last week (p. 304), we note that a large party assembled on Thursday morning for an excursion, which it was known in advance would be devoted rather to picnicking than to the serious study of old work: and yet two at least of the places visited proved to be full of interest. A lengthy drive brought the party to Llantrithyd Church and Place, where they were received by the Rev. D. Williams. The church is small, and contains nothing worthy of special attention, save a quaint Elizabethan tomb, which Mr. Edwin Seward, R.C.A., F.R.I.B.A., from the likeness of the decoration to that at Beaupré, with the purely Italian feeling of much of the detail, was



CAERPHILLY CASTLE.

REFERENCE.

1, Great Gate House; 2, Northern Curtain; 3, Northern Postern; 4, Southern Curtain; 5, Southern Postern and Tête du Pont; 6, Southern Platform; 7, Dividing Wall between Northern and Southern Curtain; 8, Outer Water Gate; 9, Postern Gallery (possibly used for stables); 10, Site of Drawbridge; 11, Eastern Gate House; 12, Site of Drawbridge; 13, Western Gate House; 14, Water Gate and Passage; 15, Kitchen Tower; 16, Inner Ward; 17, South Curtain, Inner Ward, containing the Braose Gallery or Passage; 18, Bastion Tower; 19, Bastion Tower; 20, Bastion Tower; 21, Bastion Tower (Leaning Tower); 22, Chapel; 23, State Apartments; 24, Water Tank; 25, Kitchen.

inclined to ascribe to the same architect, Fwch, who appears to have visited Italy at the same time as Inigo Jones, and to have been inspired much as he was on his first tour, which resulted in the production here of some fine "Elizabethan" work. The ruins of Old Beaupré House were next visited, being found with difficulty. The gabled front to the small courtyard is exceedingly beautiful, bearing the date of 1600, and is much better proportioned than most work of that time, while all the carvings and mouldings, as sharp now as when first erected, are delicate and refined. The following short account of the architect's career, contributed by Mr. Robert Williams, A.R.I.B.A., was read by the secretary, Mr. G. A. T. Middleton:—

One of the principal points of interest about this old building is (Mr. Williams remarked) the Early Renaissance work of the porch, by a native architect, Richard Fwch. This is his story. He and his brother William worked at a quarry near the mouth of the river Ogmore, Bridgend. Both were in love with the same young lady, whereupon they had a most bitter quarrel; hearing of which, the fair one rejected both. Richard, much affected, left his home, and travelled for thirty years in Italy, doubtless maintaining himself as a mason. At the end of the 15th century he returned, and carried out, in 1600, the porch at Old Beaupré. One of the inscriptions on the pedestals of the second order runs:—

> "Sir Thomas Johns Knight
> bwylt this porche with
> the chymnye turries [tops?] in anno 1600.
> his years 65. his wife 55."

When this work was done, Inigo Jones, the father of our English Renaissance, had not, in all probability, visited Italy. The Banqueting Hall at Whitehall was not commenced until 1619, when Inigo was 47 years of age. This early work of Richard Fwch's in the Classic Renaissance, deserves, in accordance to its purity, more than passing interest. It would appear to be the direct importation of the studies of a native

genius, who had wandered long on the sunny shores of Italy, wielding, as occasion required, chisel or pencil.

Some highly interesting comparisons were drawn by Mr. Seward between the work here and elsewhere in the neighbourhood, and it was pointed out by the custodian of the ruins—a woman who seemed to know her subject really well—that the inscriptions on the three panels read consecutively, while the meaning of the last, as given by Mr. Williams, was scarcely correct, the words which he rendered "chimney tops" being properly translated as "his wife's dowry." Lunch at Llantwit Major was followed by a vote of thanks to all who had taken part in entertaining the members, including the Marquis of Bute, Lord Windsor, Sir W. T. Lewis, Mr. Pyke Thompson, and the members of the local committee, the local secretary (Mr. G. Thomas) being specially mentioned. This was proposed by Mr. Allam, vice-president, and seconded by Mr. S. C. Johns. The President, in conveying the vote, which was most heartily accorded, pointed to the exceedingly cordial relations between architects from many districts which had been one result of the gathering of such a party at Cardiff, and to the harmonious way in which the local men, whether belonging to any or no society, had joined in receiving them. Messrs. E. W. M. Corbett, A.R.I.B.A., H. Snell, F.S.I., M.S.A., Edwin Seward, R.C.A., and G. Thomas, M.S.A., severally replied. The church was next visited, and proved to be of exceptional interest, it being erected upon the site of the earliest Christian church in England, dating back to the time of St. Augustine. A large number of Celtic crosses, some complete, and others having little more than their bases left, were shown by Mr. Nicholls and Mr. Seward, it being pointed out that the rich ribbon-pattern system of ornament which they display has been locally adhered to at all periods, besides, as is well known, giving rise to much of the carved decoration so common throughout the country in Later Norman work. The original plan of the church formed matter for much conjecture; but the most feasible idea seemed to be that two churches had existed end to end, serving for two neighbouring parishes. A drive of a few more miles brought the party to Cowbridge; but the Rev. W. Bowen, who did the honours of the place, had comparatively little to show, though the tower stairs, built up of innumerable small flat stones, were worthy of notice from the peculiarity of their construction, as were the capitals of the columns to the nave arcade, which consisted of two simple beads only separated by a portion of the shaft.

While on Thursday the points visited were little known, on Friday a tour was organised to three places very familiar to the British tourist—Tintern, Raglan, and Chepstow. To describe the charm of Tintern Abbey is scarcely necessary—it must be well known to most of our readers. It is a great pity, however, that the various fragments of old work, bosses, capitals, and vaulting ribs, which are heaped into "rockeries" for the sake of mere picturesqueness, are not arranged with some slight regard as to the positions which they had originally occupied, which it should not, in the majority of instances be difficult to discover. They are easy of access now, which is all that can be said; but this alone is something to be thankful for, and, a sketching fever setting in when the members arrived at Tintern, many a charming piece of 13th-century detail was soon represented in pencil on sketching-block or note-book, though time did not allow of much being finished. As one member of the party remarked, to make a detailed drawing of the entire ruin to a good scale would prove a complete education in the mysteries of Early Gothic work. After lunch, the party divided, the president leading the majority over Wynde Cliff to Chepstow, while the vice-president and a few others preferred to view Raglan Castle, once occupied by that famous Marquis of Worcester who was one of the pioneers in the discovery of the motive-power of steam. The hand of some such eccentric genius as himself is shown in several parts of the large building, notably in the large fire-places, each of which has two flues. Facing the main courtyard are the traces of an exceedingly fine Tudor gallery window, while a most happily devised oriel to the banquetting hall remains almost perfect, and signs are evident of the south-west porch having been roofed with fan vaulting. A curious feature, too, is a solid hexagonal tower erected on an island in the moat, so as to command the main entrance. Altogether the vice-president and his companions had reason to congratulate themselves on their choice of route. In the evening the exhibition of the South Wales Art Club was thrown open for inspection, the pictures shown, and even the architectural perspectives, being of very considerable merit. The most masterly work was, perhaps, a marble bust of Mr. Corbett by a young local man, which was shown in this year's Academy, and well reviewed. It shows power combined with delicacy—a rare combination. Presently, however, the pictures were forgotten—at least, by the younger men—for the visit terminated as it had commenced, with a concert and a dance.

LAYING-OUT PUBLIC PARKS.

THE Metropolitan parks are just now invaluable to the crowded districts of London, and with the increasing population they yearly become absolutely necessary for health, to say nothing of their influence in other more important respects. Lately several open spaces have been acquired, including Vauxhall Park, Clissold Park, Stoke Newington; Parliament-fields, Hampstead; and a park at Dulwich on ground given to the late Board of Works by the Governors of Dulwich College. The question of maintenance and preservation is trifling when once the land has been purchased or given to the public, though if it can be shown that the public, and especially Londoners, enjoy the rural element in its integrity, without the trimming-down and path-making propensities of the authorities, it seems a useless waste of labour and expense to detract from the natural beauties of the original ground by levelling, making carriage-ways, pathways, artificial lakes and grottoes, which really take away from the openness and scenery, and convert what should be a public into a private park. It is needless to point out how many of our public commons, like Clapham, and Tooting, and Epping, have been denuded of their undergrowth and furze bushes; the former appears to have suffered much from this continual cutting-down, trimming, and pruning. Everyone enjoys a common for its ruggedness and wild beauty of surface and foliage, and the attempt to convert it into a park would be an egregious mistake. It is this very roughness which gives it a charm in the Londoner's eye, satiated as he is with all kinds of formal regularity. The same distaste for formal laying out ought to be respected by those intrusted with preparation of open spaces as public parks. We can understand a few of our large areas, like Regent's Park and Battersea Park, having a portion of the space set apart for an arboretum, flower beds, and tropical gardens; but we certainly protest against any attempt to "improve" upon and convert into a sort of gentleman's park the open spaces acquired for public recreation. As an instance of this artificial treatment, we may refer to what has been done lately in Dulwich Park. Here the area has been levelled, intersected by wide carriage roads and paths, portions have been railed in for flower-beds, rockeries are made, and a lake of an artificial character, fenced off, has been formed. A little levelling and shaping may be required here and there, but we think that the natural surface of the ground, the undulations, and grass surfaces should be interfered with as little as possible. The flower-bed, as a bit of bright colour in a small town inclosure like Kennington Park, is an acquisition if it is not carried too far, so as to encroach on the space given to the public; the smooth lawns of the private gentleman's park are out of place, especially when they have to be protected by fencing. Rough levelling, where necessary for playing, and the formation of a few paths, designed with some reference to the contour of the ground, a few seats, planting of trees or shrubs on bare parts, are all that is necessary in most of the sites that have been converted into public grounds. But the sites which the County Council have under their jurisdiction and are about to acquire are generally ready-made parks, well wooded and laid out, and which require very few alterations to make them suitable for public recreation and enjoyment. Seats are indispensable, boundary fencing is necessary; but these requirements are more necessary in small inclosures surrounded by houses than in the larger suburban parks and playgrounds like those in the north and south of London. In fact, the design, laying out and gardening operations necessarily ought to have some relation to the position of the ground. When the land is small, and bounded by houses, a more artificial arrangement is called for than in a large area surrounded by suburban villas and roads.

The park for Finsbury, inclosed and laid out in 1869, affords a good example of an area of 115 acres, once open on every side to fields, now surrounded by streets and houses immensely adding to the value of house property in the vicinity. The parks, gardens, and open spaces now under the control of the County Council amount to an area little short of 3,000 acres, and this area is increasing at a very slow ratio compared with the area being covered with houses. The preservation of the natural beauty of the parks is the first consideration, which does not appear to appeal to the taste of the average gardener, who likes to cut down, trim, and level, and to rob the ground of those rural characteristics for which it has been acquired.

CHIPS.

The foundation stone of an orphanage for Blackburn was laid on Saturday afternoon by the Mayor of that town. The building is estimated to cost £3,700, and will be erected at Wilpshire.

The Great Eastern Railway opened on Monday a new branch line from Ramsey to Somersham. The line has been constructed by a syndicate at a cost of £65,607, and will open up a district which has hitherto been practically "out of the world" for want of railway accommodation.

A stained-glass window has been placed at the west end of the south aisle of Thorverton Church, Devon, and was unveiled last week. Mr. C. Drake, of the Churchyard-close, Exeter, was the artist.

The Cracow Town Council have had plans prepared for the construction of an aqueduct 21¾ miles long, to convey water to the town from the Regulice, and are now seeking tenders, and proposals will be received up to October 1 next by the Aqueduct Commission in Cracow. The estimated cost of the work is from 1,800,000fl. to 2,100,000fl., and plans and approximate quantities can be obtained on application to the commissioners.

The highway bridge spanning the Great Western Railway line at Barton-road, Hereford, is being reconstructed at the cost of the company, so as to give an additional 7in. head-room above the permanent way, making its elevation above the railway level 14ft. It has also been widened, and is now 25ft. 3in. in width, as compared with its previous 23ft. 9in. An old stone wall and iron fence have been replaced by a brick parapet topped with blue brick coping. The work has been carried out by men in the company's employ, under the direction of Mr. Armstrong and Mr. Matthews, the company's engineers.

On Thursday, the 29th August, a stained-glass window, placed in Frogmore Church, Herts, in memory of the four children of Mr. and Mrs. Oliver, was unveiled. The window, which is a single light, is divided into three compartments. In the centre panel our Lord is depicted blessing the children. Four of the little ones are portrait drawings of the children. The panel above is filled with ornamental work, a central medallion bearing the lily; below, an angel in a corresponding medallion holds an inscribed scroll.

Mr. George S. Loudon, of Allanton and Hermand Brick and Tile Works, West Calder, N.B., has invented and patented a method of utilising waste or exhaust steam from stationary engines, which may be applied in connection with the manufacture of bricks, tiles, and all classes of pottery work, also for drying or seasoning wood, and for drying purposes generally. It is claimed for the invention that it may be employed in heating churches, halls, greenhouses, and all kinds of buildings.

A new railway station at Elswick, Newcastle, was opened on Monday. The platform is on the island system, is 420ft. in length, and 24ft. wide. The station has been built by Messrs. Simpson Bros., of Blyth, from plans furnished by Mr. Bell, architect to the North-Eastern Railway Company. Mr. Storey, from Mr. Bell's office, has had the general supervision of the erection; Mr. Shouksmith, York, has fitted up the lighting arrangements; and the painting has been done by the workmen of Mr. Potter, York.

The men employed by Messrs. Longmire and Co. on the works at St. Alban's Abbey to the number of about fifty had an excursion to Brighton on Saturday week.

Memorial stones of a new Wesleyan school-chapel were laid at Cleckheaton on Saturday. The building will cost £900, and is being erected from designs by Mr. W. H. Howarth, of Cleckheaton.

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ILLUSTRATIONS.

SIENA CATHEDRAL WEST FRONT, BY GIOVANNI PISANO—CLOCK TOWER AT CLACTON-ON-SEA—SOUTH PORCH, CLEY-NEXT-THE-SEA—ST. MARGARET'S CHAMBERS, MANCHESTER—A VILLAGE ELEMENTARY SCHOOL.—DRAWING-ROOM AND PARLOUR FURNITURE.—OLD PORCH REMAINING IN ST. ALBAN'S ABBEY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

SIENA CATHEDRAL: THE FACADE BY GIOVANNI PISANO.

THE sculptor architects of the 13th century were a natural production of an age of church building—an age when the impulse of religion was intense. Hardly had the enthusiasm of the Crusades died away when the heart of Italy was stirred within her by the poetic fervour of the divine St. Francis, drawing all earnest souls to join his devotions on the Umbrian hills and valleys, and an echo of inspiration answered back to him farther north from the sterner St. Dominic; so that, between the fire of love and the fire of self-denying zeal, all Italian hearts took flame. Each city, as it formed its political government, set itself as a primal patriotic work to build a grand cathedral for its religious worship. That at Pisa had already been built (1063—1180), the foundations of the city dating earlier than the others. In Siena the work extended from 1089 to 1333, or later. It is said that Niccola made the design for the façade in 1264; but whether he worked on the plans or not, says Leader Scott, there is no evidence to show. The archives have records of Lorenzo Maitani, of Siena, having been capo maestro during several years from 1290; but no proof exists of his having designed the front himself. It is true, adds Scott, that on being removed to Orvieto in 1310 he repeated the same design there with very little alteration. We propose, at an early day, to give a similar illustration of this latter church to that which we publish to-day of the great façade at Siena, and thus a ready comparison may be made by our readers. Orvieto is more varied, although not more harmonious in its parts. A greater richness and grandeur are given to it in the enlarged size and deep-setting of the centre door, and richer tracery and more pleasing surroundings of the wheel window above. The effect, notwithstanding, of large gables and pilasters exaggerated into towers is scarcely so satisfactory. In general effect and colouring there is, however, a very close similarity between them, and they both furnished a school of sculpture for nearly a century. The Siena façade, constructed in 1270-1380 from the design of Giovanni Pisano, illustrates a beautiful combination of Pointed and Circular styles, carried out with every elaboration of detail. It is composed of red, black, and white marble, and richly decorated with sculptures representing Prophets and angels, carved by various masters, partly painted and gilt. The façade is literally covered with ornament. There are several animals symbolical of the cities which were allied to Siena at different periods. Above the portals are statues of the three saints, Catherine, Bernardino, and Ansano, who were natives of the place. The most remarkable sculptures in the front are the series of Prophets and the two angels, by Jacopo della Quercia. The columns of the great doorway are surmounted by lions, the emblems of Florence and Massa. The Sienese school of sculptors, which Niccola found a mere confraternity of stone-cutters, and left a band of artists, flourished for some centuries. Agostino and Agnolo were its first bright lights, and rose to the greatest celebrity, one of their grandest works being the monument to Guido Tarlati, the warlike Bishop of Arezzo, erected in Siena Cathedral in 1327-1330. In later times the school produced Jacopo della Quercia, mentioned above, who is to be reckoned second only to Michel Angelo in power and superior to Florentine masters of the 15th century for sweetness. Such an embodiment of beautiful conception and masterly execution as this vast front of Siena Cathedral presents was never surpassed by works of the same date and like character. This photographic illustration given herewith to-day, therefore cannot fail to be valued by our subscribers.

CLOCK TOWER, CLACTON-ON-SEA.

THIS Clock and Outlook Tower, with drinking fountains, &c., has been designed for the Clacton Improvement Association, by Mr. T. H. Baker, architect, Clacton-on-Sea. It will occupy a commanding position at the junction of five of the principal roads, and will command extensive views of sea and land. It is 80ft. high and 45ft. to the balcony floor, which is reached by a circular iron staircase. The building is to be of Doulting stone, with lead roof. The clock will have four faces, with illuminated dials, and chimes of four bells. In the base are three drinking fountains, and a dog trough. The estimated cost is £1,700.

SOUTH PORCH, CLEY-NEXT-THE-SEA, NORFOLK.

ACCOMPANYING our reports of the recent excursions of the Architectural Association into this part of Norfolk,* which is bounded by the Wash, we illustrated, among other typical examples of the architecture of the district, some remarkably fine porches, such as those of St. Nicholas' Chapel at King's Lynn, and from the grand church at Walpole, St. Peter's. The porch, of which we give a drawing to-day, by Mr. W. Harold Oakley, represents another specimen of rich work of like character from Cley-next-the-Sea, an out-of-the-way church situated between Cromer and Wells, some six miles north of Holt. The building is for the main part Perpendicular in date, and even among Norfolk churches is rightly reckoned a fine one. The fabric has been restored, but enough remains to clearly indicate the former importance of Cley and its port. The font is worth special mention for richness, and its carvings are emblematical of the seven Sacraments of the Church. The country here, as at Lynn, is quite flat, uninteresting marshland, and records tell of how the "rustics" in 1174, during the quarrels between Henry II. and his sons, took Roger Bigod, nephew of the great Earl of Framlingham, prisoner when he landed at Cley after having been driven from his castle at Axholm and crossed from the Lincolnshire coast. Ralph, of Diss, and the so-called "Benedictus Abbas" are the best authorities concerning the history of this revolt, giving an account of the doings of the Bigods, the Earls of Suffolk, whose strongholds were Framlingham and Bungay. Hugh Bigod was at one time the most powerful of the rebels in Suffolk and Norfolk, and he, with the Flemings in his pay, burnt Norwich. Subsequently he "made peace" with Henry II. in 1174, after the incident at Cley to which we have referred, and when the king encamped at "Saleham" (Syleham, on the Waveney) Hugh surrendered his castles, which were dismantled (rex fecit sternere) by the king's warrant two years later. Somehow or other Framlingham was restored to Bigod, who soon repaired or rebuilt it, since we learn that in 1215 King John attacked Roger Bigod here and turned him out of his fortress. He speedily, however, regained it. The double-headed eagles which ornament one of the chapels in the church at Cley-next-the-Sea are thought to refer to a Guild of German merchants once established here, and this probably is the reason for other instances of their use, which we noticed when visiting other churches in Norfolk.

NEW BUILDING, PICCADILLY, MANCHESTER.

THIS illustration shows a block of buildings now being erected in an important thoroughfare of Manchester. It consists of shops on the ground-floor, offices, with passenger lift, on the other floors, and restaurant in the basement. The architects are Messrs. Heathcote and Rawle, of 6, Princess-street, Manchester; and the contractors are Messrs. R. Neile and Sons, Manchester; Mr. Stephenson, of Hyde-road, being the stonemason.

A VILLAGE ELEMENTARY SCHOOL.

SEE "Practical Architecture," on page 313.

* See BUILDING NEWS, Aug. 9th, 16th, 23rd, and 30th.

DRAWING-ROOM AND HALL FURNITURE.

THE Chimneypiece in the Louis Quinze style is in dark mahogany and gold, with Bartolozzi panel on satin in the centre. The Screen to the left is painted white, with Bartolozzi and damask panels. The other screen for partly dividing two rooms is in good taste, and, from its soundness of constructive principle, is agreeable to the eye, which is more than can be said of much decorated furniture of the present day. Here we have the panelled framing, with no open-work about it, forming a solid base; then above that an elegant baluster arrangement, and over all an open arch, lighter still. Much can be done in conjunction with this screen in the way of draping. The Italian Walnut Cabinet below, with panels representing the signs of the Zodiac, is an effective and substantial piece of furniture. It is fitted with convenient cupboards and shelves. The Teacup Screen is pretty, but, we should say, would lead to "many a slip 'twixt the cup and the lip," though its uses for laying down a book or article of work would be handy to have at one's elbow. The Sheraton Chair, with shield-shaped back, is stained green and decorated with leafwork. The two pieces of Hall Furniture are both sensible pieces; the cabinet is in mahogany, ebonised. The Combination Table, Umbrella Stand, and Cupboard we like much; there are commodious resting-places for bulky umbrellas, and good-sized wells to receive the water on wet days. This latter point, in numberless cases we have noticed, is wofully ignored, and yet it is most essential. Not only does a shallow tray soon become filled, but there being no good catch for the end of the umbrellas and sticks, they too often slip out and protrude in various attitudes in an untidy fashion, and frequently fall out altogether.

PARLOUR FITTINGS AND FURNITURE.

THIS sheet comprises some interesting objects from the showrooms of Messrs. H. and D. Cooper, of Great Pulteney-street, W. The Mantelpiece at the top is made in walnut, and would form an important feature in any room. It is described as being a replica of an old Italian examples, and could, of course, be upholstered to harmonise with the pervading tone of the apartment. The Sedan Chair is a picturesque and an essentially decorative object, suitable for giving an old-world air to a hall; though not devoid of use either, especially in a large apartment where the furniture, of a distinctly utilitarian character, is insufficient to fill the many voids and corners. The ingenuity and taste of the artistic decorator is thus called forth to furnish some device, either novel in its character, or, as in this case, a relic of by-gone days. This Chair is painted and decorated, and sumptuously finished with old brocade and Spanish leather. The three-leaf Screen, below to the left, is made of genuine old Arabian lattice-work (Meshrabeyah), and as the plate shows, makes a pleasing background to a couch. The tallest leaf is 6ft. high, and variety of effect is gained by the broken line of the heights and the consequent diversity in the panels beneath. The Writing Cabinet, made in ash and stained blue, is an elegant and useful adjunct to a boudoir. To those who are nothing if they are not French the Screen in the Louis Quinze period will commend itself, where curls and twists run riot, and all formality is banished. We ourselves prefer the quieter feeling of the Eastern screen, and believe it will give more lasting pleasure.

Mr. R. M. Craven, M.R.C.S.L., has been elected medical officer of health for Westmoreland, in succession to Dr. Paget, who has been appointed to a similar position in Salford. There were 55 candidates to the office, the salary attached to which is £375 per annum.

WAYSIDE NOTES.

THERE is a pleasing look about the announcement of the competition for the proposed municipal buildings at Sheffield. An £80,000 job may be regarded with pleasurable anticipation by the "retail" class of competitor who is given to wisely economising his energies, and who concentrates his efforts on things worthy of much trouble in an endeavour to secure them. Here, indeed, is, if not an ideal competition, one which on the face of things is certainly most admirably arranged. To begin with, when Mr. Waterhouse consents to act as an assessor, a competition is as good as decided with satisfaction to all parties. Then, it is planned on the dual system, which hitherto has been found to work with infinitely less of that unpleasant friction than accompanies the ordinarily-arranged competition. Furthermore, there is a liberal allowance of premiums: and divided, as it is proposed to be, among, perhaps, six competitors, those entering for the struggle have very good "odds" in the chances of pulling off a decent premium. Three clear months are allowed for sending in, and these months being such as succeed to the season of health-recreation for the majority of persons, competitors may start with that hale condition of mind and body which, in these days of high pressure, is necessary to a successful competing architect. Yes, here, indeed, is an apparently satisfactory competition advertisement. The time of the bulk of competitors is not wasted in futile labours on detailed drawings; and those who do have to prepare elaborate plans, &c., will receive remuneration which should pay every reasonable expense for labour of self and staff, including an additional consumption of midnight oil.

If I must be critical, there is just one thing about the advertisement that seems to be worthy of attention. Three months is a good space of time for the preparation of mere sketch-plans; it may be that there will be scope for those so inclined to get in much extra labour, over and above that contemplated by the inaugurators of the competition. Competitors should assure themselves that the instructions issued are well worded in this respect, and that no loop-holes exist for any who would take unfair advantage of others by sending in drawings of a description and prepared in a manner that is not intended by those who have arranged the competition. It is of no use having dual competitions if the end of such is to be defeated by the unscrupulous. Drawings uncalled for by the conditions, and dressed up in a medium not requested by the promoters, give an unfair advantage. I doubt not but that, as Mr. Waterhouse's name is associated with this competition, the conditions will be as perfect as possible. It is just as well to make sure from the first, however, as by so doing competitors may go to work with confidence. Complaints, if justifiable, made in a courteous manner and promptly to the inaugurators, by a large number of would-be competitors, usually receive attention from the promoters; whereas, if any doubtful points are passed over with indifference, after-complaint comes too late. In very many instances prompt action on the part of the profession has changed what would have been a disastrous competition into one which has given satisfaction to all—if this is possible in an architectural competition.

Judging by past experiences, a successful competitor in a dual competition must be a neat, and almost microscopic, draughtsman. The scale enforced for elevations being so minute and extensive details being generally forbidden, it becomes of advantage to one to be able to show much detail in a clear and fine style of drawing. Modern draughtsmen, or rather those still drawing in the manner of the palmy days of the Gothic Revival, may feel inclined to kick at this; but it is evidently of importance. It is, of course, impossible to say to competitors, "You shall not show more than so much, or such-and-such, detail;" and therefore the fine draughtsman gets the pull over those who draw with the black, splashy line. It would doubtless be well if mere pencil sketches were asked for in dual competitions. Under the system that allows competitors to prepare their drawings in ink, the end and aim of dual competitions—to save useless labour—is often defeated. I would have the style of get-up as simple as possible, just such a series of pencil sketches as one at times submits to a client in everyday work. By a rigid enforcement of wise restrictions, the dual competitions might become as effective in saving labour as it is intended that it should be. At present this desirable object is not always attained, and as much unremunerated labour is given by the profession as in competitions of the ordinary type.

After perusing the letters of Messrs. Longmire and "Ars" in your last issue, it came home to me very forcibly that it was high time to take a more energetic part in the St. Alban's discussion. Having read par No. 1 of friend "Ars's" letter, I for the moment felt that perhaps, unknowingly, I had committed some enormity that ought to be confessed. "Ars" says:—"Messrs. Longmire have a legitimate grievance against him (that's *me*), and justly refuse to discuss any other matter with him (ye ancient 'G') until he apologises for repeating the exploded nonsense about the stencilled deal ceiling in nave." If "Ars" continues in this style he will bring my grey hairs in sorrow to the grave. Still, as I have said, I, for the moment, really thought I *had* repeated some "exploded nonsense," and forgotten the fact of having done so. Wearily I searched the back numbers of the "B.N." containing the "Wayside Notes" concurrent with the St. Alban's discussion. With what result? *There is absolutelely no mention of, let alone comment on, any "ancient painted ceiling," until Messrs. Longmire thought fit to saddle me with an expression contained in your report of what Mr. Gough said on the occasion of the St. Paul's Ecclesiological Society's visit to St. Alban's!* I cannot say whether any old painted ceiling was pulled down in the nave or not; but this I can say, that visitors to St. Alban's Abbey are led to make this inference from the information vouchsafed by attendants at the Abbey. I ask again, What has the "ancient painted ceiling" to do with the main issue of this question, which is—whether St. Alban's Abbey should continue to be destroyed at the instigation of Lord Grimthorpe? By harping upon the subject Messrs. Longmire weaken their cause, as it shows that, as I have before said, they are prepared to swallow the camel whilst straining at the gnat. I had hoped to have been able to speak with authority on this question of whether any old coloured ceiling was removed from the nave or not; but having had no time to get together any indisputable facts, I am not for the moment in a position to do so. Meanwhile, I beg to object to explain expressions used by others, and to ask "Ars" to, in future, look before he leaps in matters concerning any statements he avers that I have made.

Now, let me leave the mystery of the "ancient painted ceiling" to be unravelled by such as it may concern: it is at the best a side issue, and fastened upon by your correspondents because they have nothing better to hold on to. Like a straw upon the surface of the deep waters of adverse opinion, they have clutched it in despair. But we will leave the subject, and avert to the "Sheet of Contrasts." I am glad to be able to inform Messrs. Longmire, and your readers generally, that early this week I repaired to the venerable city of St. Alban's, and expended much time in a careful examination of the Abbey and a laborious comparison of the "Sheet of Contrasts" with the actual work executed. I have, as I write, a "Sheet of Contrasts" before me, with certain red marks thereon, which I made on the spot to indicate the parts of Mr. Steinmetz's sketches, where I consider he has failed to observe exact draughtsmanship. First I will take the new north transept. Here, I think, the draughtsman has (1) not drawn the great round window sufficiently large, and (2) the turrets at the angles are a shade too wide; (3) the two old Norman windows are not sufficiently near to the first string-course, and (4) two little lights at the bottom stages of the turrets are omitted. In the case of the drawing of the new south transept, I find I have made no other marks than two, showing the omission of the little windows. They have here been left out as in the case of the drawing of the north transept. These are all the marks I have made indicating want of accuracy; the drawing of the great round window is a very fair representation as regards proportion and detail, and decidedly flattering. The drawing of the new "19th-century porch" is an exact representation of the actual thing; the five lights of the south transept, as seen from interior, are correctly delineated. Any rough sketch would serve to show the sham treatment of the lancet heads, and the "cloister wall" shows the brutal treatment of the beautiful old work. I did not see the old door anywhere; and I have nothing by me to say whether the drawings of the old transepts and the old slype door are correct. Judging from what I remember, they *are* correct sketches of the old work, and if they are not, it would not vastly affect the main issue.

Of what importance are these veritably *trifling inaccuracies* which I have detailed? Let us consider. The large round window is too small; this is unadvantageous; its fearful ponderosity is its most objectionable feature. The side turrets are too wide: this advantageously affects the drawing; the round window looks less obtrusive. Two little staircase windows are omitted in the turrets of either transept; this affects nothing and no one. On the whole, the "Sheet of Contrasts" is very flattering to the new "Grimthorpian" architecture. *I positively assert that, from a mere inspection of the "Sheet of Contrasts," no one can gather any idea of the frightful barbarity of the designs of Lord Grimthorpe — the brutal coarseness, the loud vulgarity, and the impudent self-assertiveness evidenced in the "architecture" of the new transepts.* Out of scale, of ignoble proportions, crude in outline, puerile in detail, evidenced ignorance of every true principle of architecture, I unhesitatingly condemn them as the greatest architectural abortions the world has witnessed. I make no scruple to assert that their presence at the Abbey is a scandal, and, if allowed to continue, they will be a standing disgrace to the nation.

GOTH.

CHIPS.

The foundation-stone of St. John's Church a Dunton Green, in the parish of Otford, Kent, was laid on Thursday afternoon. The edifice is expected to cost £1,800. The style is Early English, with red brick facings. Mr. T. Potter, of Sevenoaks, is the architect, and the Mid-Kent Co. are the builders. The site adjoins the high road leading to London, and is just opposite the lodge gates of Broughton House.

An inquiry was held at Wells City, before Major-Gen. C. P. Carey, one of the inspectors of the Local Government Board, on Tuesday week, relative to an application from the city council for sanction to borrow the sum of £17,000 for the purchase of the water company. No opposition was offered to the scheme, and the inspector intimated that he should recommend sanction to a loan of £16,000.

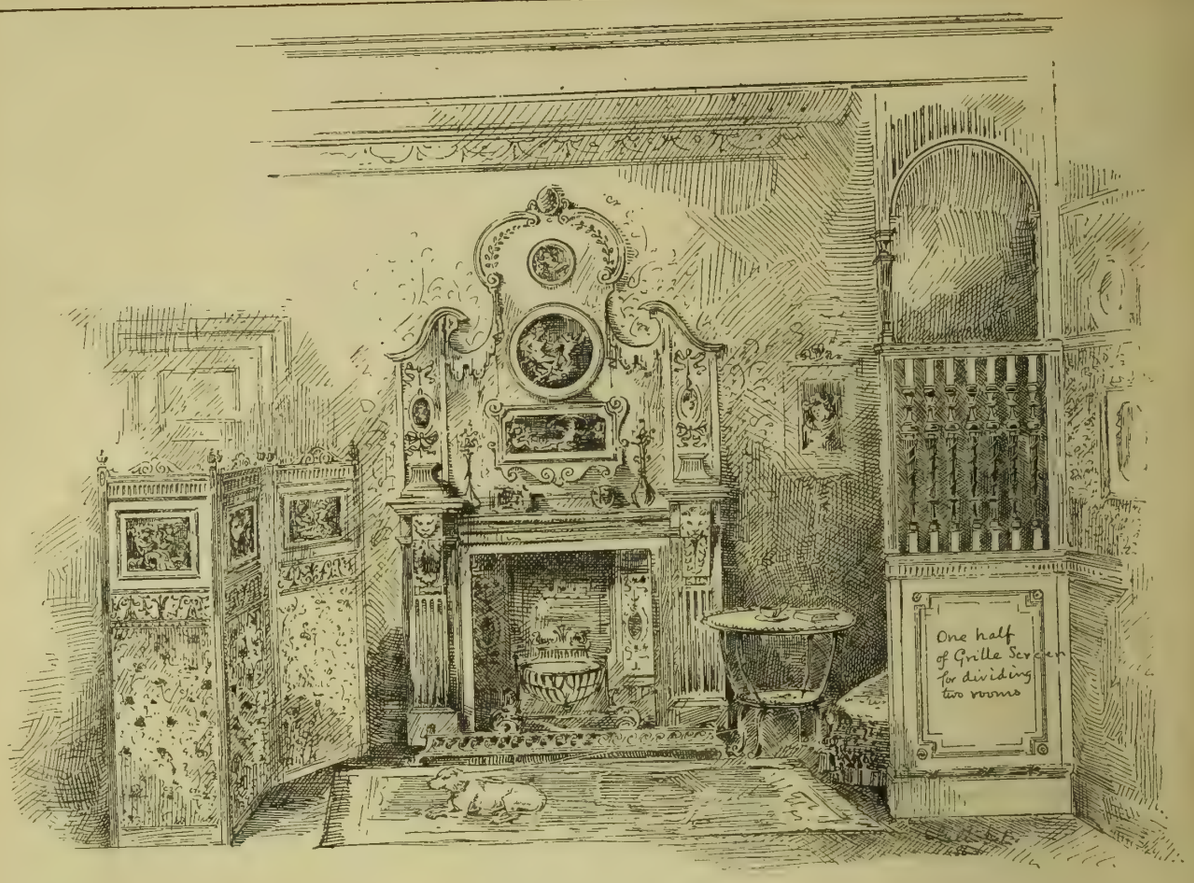
In the action, "Storry v. the York Corporation," brought to recover damages for injuries to property caused during the construction of the new lock at Castle Mills Bridge, York, Mr. C. R. Chorley, F.R.I.B.A., of Leeds, to whom the case was referred for the assessment of damages, has awarded the plaintiff £160.

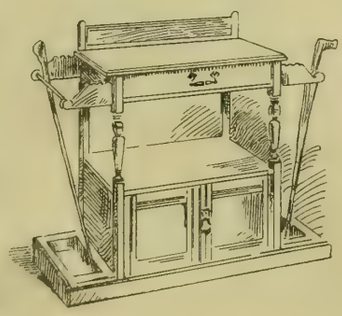
The members of the Sussex Archæological Society had their annual excursion on Friday. The members proceeded by carriages from Arundel to Bignor, where the remains of the Anglo-Roman villa, with its tesselated pavements, were examined, Mr. E. J. Fox acting as guide. Bignor Church, which contains some Norman work, and the smaller church at Burton, containing monuments of the Goring family, were afterwards seen, and the day closed with an inspection of Lord Leconfield's seat, Petworth House.

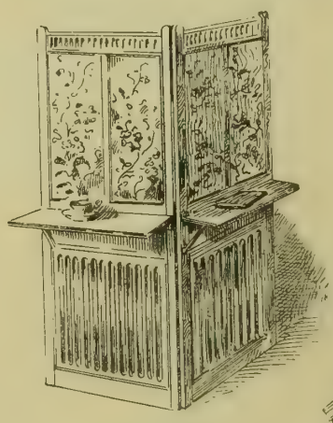
A stained-glass memorial window has just been inserted in the north aisle of the parish church of Malpas to the memory of the late Admiral Tarleton. The work has been executed by Messrs. H. Eaton, Butler, and Bayne, 14, Garrick-street, Covent-garden, London, who, upon two former occasions, have executed work of similar character in the church—the windows to the memory of the late Rev. C. W. Cox and to Bishop Heber. The subject of the present one is the Resurrection.

Litigation has been commenced as to the proposed restoration of the parish church of Dunbar, for which plans, prepared by Messrs. Hay, of Edinburgh, were recently adopted by the Dowager Duchess of Roxburghe and a committee. Certain of the heritors fear that the proposed works would exceed in cost the sums received by the restoration committee, and that the balance would have to be made good by them. An interim interdict has been obtained to prevent the alterations from being commenced.

The premises of Messrs. T. Fox and Co., cabinet makers, of Bishopsgate-street Within, were destroyed by fire on Saturday night. A building of five floors, used as showrooms, workshops, and stores, was gutted.



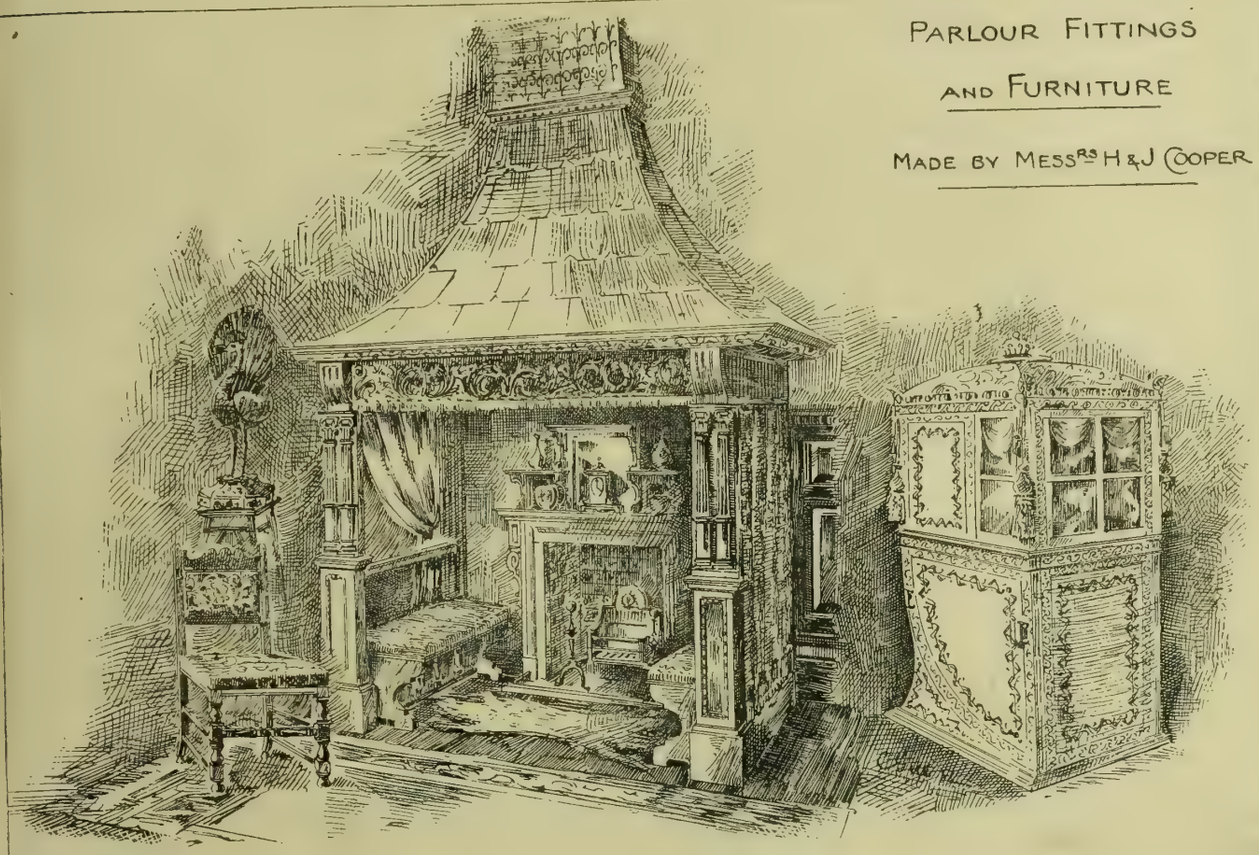


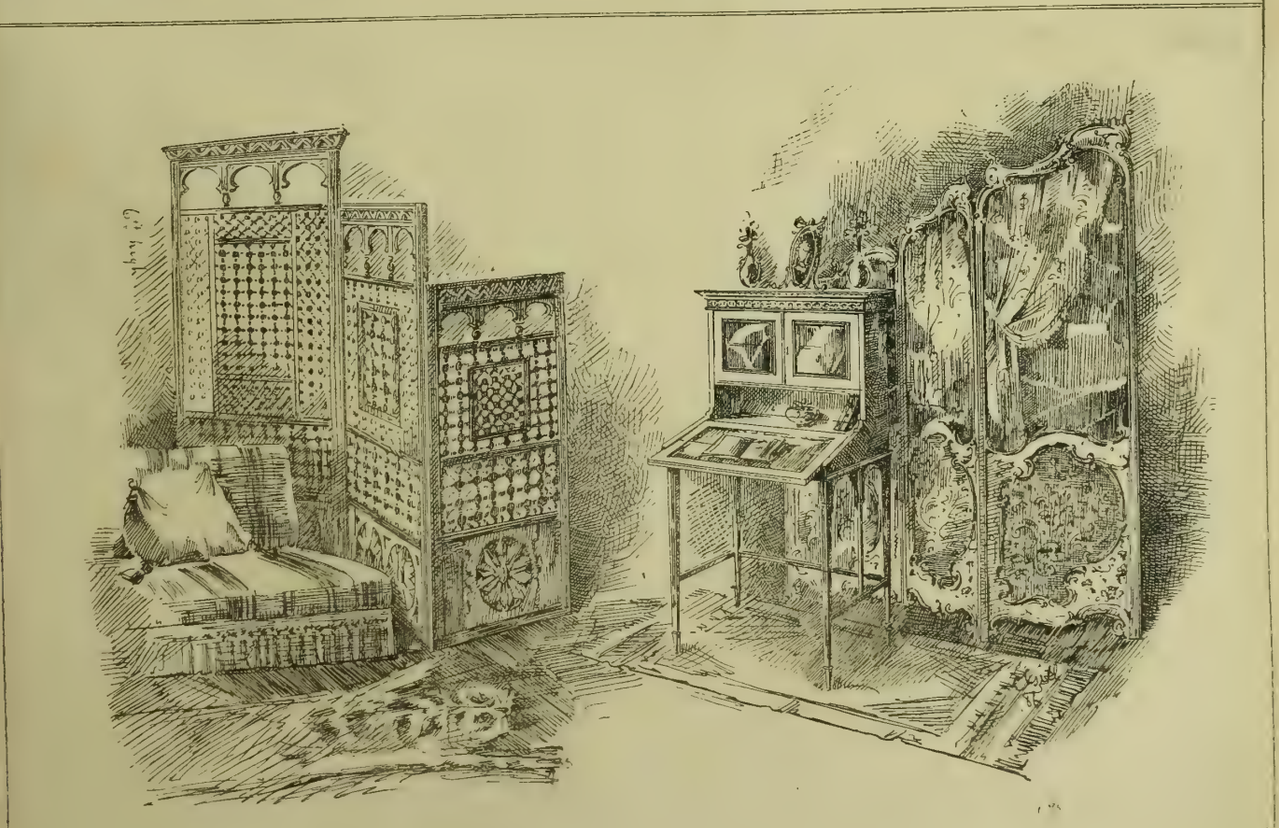


DRAWING ROOM
AND HALL FURNITURE
MADE BY MESSRS H & J COOPER



PARLOUR FITTINGS
AND FURNITURE
MADE BY MESSRS H & J COOPER





Building Intelligence.

GLASGOW.—The new Municipal Buildings, having been completed, have been thrown open for public inspection during the present week. The buildings contain 350,000 cubic feet of stone, 19,000 cubic feet of granite, and 10,000,000 bricks. The site is bounded by George-square, John-street, Cochrane-street, and George-street; the buildings, which are four stories in height, having frontages to these various streets and the whole of the east side of the square. In the centre of the block is a large quadrangle, with carriage and foot entrances from three sides. The style adopted is that of a free treatment of Italian Renaissance. Dignity has been sought to be obtained by good grouping in the masses and by a sense of the gradation of the features. Each of the fronts has an individual treatment of its own, while unity has been given to the whole design by repetition and balance in the outline of the composition. Over the chief front in George-square is the Jubilee Pediment, which has a length of 50ft. and a height in the centre of 11ft. The central figure is that of Queen Victoria seated on a raised dais, and supported on each side by figures emblematic of England, Scotland, Ireland, and Wales, with two figures reclining at the foot of the steps which lead to the throne. The spaces on each side of the middle group are occupied with carvings illustrative of the various British possessions. The Municipal apartments include the banqueting hall, 120ft. by 50ft. and 50ft. in height, the council chamber, 60ft. by 30ft., with central alcove an additional 20ft. in width; the satinwood salon, or municipal drawing-room, the octagon chamber, the mahogany salon, the Dean of Guild Court, 50ft. by 30ft. The architect is Mr. William Young, of London, and Mr. Henry D. Walton, of Glasgow, has been his assistant on the buildings. The clerk of works is Mr. E. C. Morgan, and the principal contractors are as follow:—General contractors, Messrs. Morrison and Mason; joiner (sub-contractor), Mr. James Morrison; plasterers, Messrs. D. and J. M'Kenzie; marble work and mosaic floors, Messrs. Galbraith and Winton; outside plumber work, Messrs. Wallace and Connell; inside plumber work, Messrs. Brown and Young; slater work, Mr. William Meikle; painters, Messrs. Carlton and Sons; council-chamber and first reception salon, Messrs. Wylie and Lochhead; painters of council-chamber, Messrs. J. B. Bennett and Sons; plasterer, Mr. R. A. M'Gilvray. Two reception salons next George-street, Messrs. M'Kenzie and Co., Buchanan-street; plasterer, Mr. R. A. M'Gilvray; painters, Messrs. Peter Darroch and Co.; tile work, Mr. James Duncan. Superintending electrician, Mr. David Cook; cast-iron work, Messrs. M'Farlane and Co.; sculptures, Mr. John Mossman, Glasgow; Messrs. George Lawson, London; Rhind, Edinburgh; Farmer and Brindley, London; Mr. Charles Grassby, Glasgow; Mr. Edward Good, Glasgow; and Mr. James Young, Glasgow. The following illustrations of the buildings have appeared in our pages:—Plan, elevations, and sections of the original design, as selected in competition, Sept. 15 and Nov. 10, 1882; perspective of design as finally carried out, May 1, 1885; central bay of George-street façade, Jan. 16, 1887; bay of banqueting hall, March 29, 1889; spandrels, carved by Mr. John Mossman, Sept. 16, 1887; statues, by Mr. John Rhind, April 20, 1888.

HERTFORD.—The new building erected on the Old Cross, Hertford, as a permanent memorial of Her Majesty's Jubilee, for the accommodation of the Free Library and School of Art, was opened on Thursday, the 29th ult., by the Right Hon. A. J. Balfour, M.P. The style is Elizabethan, and the material used in construction is red brick. On the left of entrance are the reading-room and library, about 42ft. by 22ft., with an alcove at each end. The books are arranged on shelves in the recess at the north end, and on a gallery running along the east wall. The whole of the floor above is allotted to the School of Art, and consists of three rooms, one being for the elementary students, another for the advanced class, and the third for those engaged in painting from the life. These rooms are divided by sliding doors and revolving shutters, so that they can be used either as one large room or as three separate ones. On the same floor is a small room for the principal, and a lavatory and cloak-room for lady students, while a similar apartment is provided for men upstairs. Apartments are also provided on the ground floor for the librarian and his family. The building is warmed throughout by hot water, and wooden blocks are extensively used for the floors. The joint architects were Mr. R. T. Blomfield, of London, and Mr. W. H. Wilds, of Hertford; and the builder was Mr. H. Norris, of Hertford. The contract price was a little under £2,200.

RUTHIN.—The memorial-stone of the new Welsh Prebyterian chapel, Ruthin, North Wales, was laid on Aug. 29th. The architect is Mr. T. G. Williams, Liverpool, and Mr. Richard Lloyd the builder, of Corwen. The style of the building is Gothic, freely dealt with. The front portion of the chapel will be circular on plan, having a radii of 27ft., and measures internally 55ft. by 54ft., and will be entered through two doorways placed in tiled porches, leading to vestibules on each side, and having doors glazed with cathedral glass. The chapel is to seat 450 persons, and the sittings are to be arranged in a circle gallery form, or in an isacoustic curve from the pulpit with stepped aisles leading to the body. The schoolroom, 41ft. 6in. by 24ft., is placed at the rear of the chapel, with a minister's vestry, 14ft. by 12ft.; also a lavatory, book closet, and other conveniences. Below is the cellar, containing boiling-room, heating-cellar, and coals, provided with sinks, boiler, cooking range, and other conveniences. The roof the chapel is to be in one span of 54ft. (inside measurement) supported by stained pitch-pine hammer-beam principals. The cost, exclusive of land, will not exceed £2,000.

CHIPS.

The Portman Rooms in Baker-street, W., are being decorated by Messrs. Campbell, Smith, and Co., from designs by Sir. A. W. Blomfield and Mr. J. S. Paul.

The corner-stone of a new Roman Catholic Church for Watford was laid on the 29th ult. The building will be dedicated to the Holy Rood, and will consist of nave, 26ft. 9in. by 70ft.; and chancel, 25ft. by 35ft., with ambulatory round. The style is Decorated Gothic, and the materials employed are flint for facings, Bath stone for dressings, and tiles for roofing. A turret will flank the church on either side, and will contain the angelus and sanctus bells. Mr. J. F. Bennett, John-street, Adelphi, W.C., is the architect; and Messrs. T. Turner and Co., Watford, are the builders. The church will seat from 450 to 500 persons.

For the last nine months about 80 men have been at work on the Great Northern Railway at Newark, erecting a new bridge over the river Trent, and removing the old tubular, or Warren truss bridge. The Warren bridge, which was erected 35 years ago, is constructed of cast and wrought iron and timber, whereas the new one is all steel, and on the Whypple-Murphy truss principle. It is situated about a quarter of a mile from the Great Northern Station, and is described as the largest on the Great Northern main line. The designs were prepared by the engineer to the company, Mr. R. Johnson, C.E. It is estimated to cost about £18,000, and will be completed in February next.

A little 6th century vase from Corinth has been presented to the British Museum by Mr. Malcolm Macmillan, whose fate is still an unsolved mystery. It is the third of its class which has been added to the Museum collection, and is under 3in. in height; the body is cream-coloured, and on it is painted in black, red, olive, and purple bands of ornamentation, filled in with representations of animals, figures, and conventional ornament. The treatment is essentially Phœnician in character, and is probably an adaptation of Oriental design by an artist of the Athenian schools.

New co-operative stores in Cowper-road, Great Berkhampstead, were opened on Tuesday week. They include a range of shops, with store-rooms and kitchen above, and on the second floor a hall seated for 300 persons. Mr. J. F. Goody, of Colchester, was the architect, and the outlay has been £2,000.

The Duke of Bedford has given Goldington-crescent-garden, Camden-town, as a site for a technical institute, but suggested that he would not object to the sale of the crescent garden and the application of the proceeds to the acquisition of a more eligible site elsewhere for the institute. The vestry of St. Pancras, therefore, propose that the London County Council be asked to purchase this garden and maintain it as an open space out of the £12,000 which they received from the Midland Railway Company for the purposes of open spaces in the parish, and in consideration of the acquisition of part of the old parish burial ground by the company.

Engineering Notes.

THE PROJECTED IMPERIAL DOCKS.—A scheme is being matured for constructing a deep-water dock between the Victoria Docks and the river. The area of land to be acquired will be about 34 acres on the north side of the Woolwich-road, and about 56 acres to the south of it. When the works have been fully carried out the water area of the new docks will be about 52 acres. The Imperial Docks, as they will be called, will comprise an outer basin or merchandise docks, and an inner basin or service docks, with dry dock accommodation. The outer basin will contain 29·35 acres of water space. The area of the quays and jetties is 2,143,000sq.ft. (over two-thirds of that of the Royal Albert Docks), and the quay frontage is 14,600 lineal feet (being 2,000ft. less than that of the Royal Albert Docks). This basin is to be approached by a lock 600ft. long by 85ft. wide, leaving 36ft. at ordinary spring tides over the sills, and with a depth of water at lowest neaps of 32½ft. A double railway will surround this basin and run on to each quay. There will also be a barge lock, permitting of the entry or exit of barges at any state of the tide. The inner dock, for the service of the liners, will include the existing graving docks, workshops, and pontoons belonging to the Victoria Graving Dock Company, which is in liquidation. By excavating and deepening the graving docks, and dredging away the bays on their west side, 23·25 acres of water area can be provided for vessels dry-docking or lying up for repairs. The outer and inner basins, both fully equipped, will cost respectively £430,059 and £324,019, making a total of £754,078. Other expenses bring the total estimated cost up to about £875,000.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

DURHAM AND NORTHUMBERLAND ARCHÆOLOGICAL AND ARCHITECTURAL SOCIETY.—Last week the members of this society enjoyed a two days' excursion into the North Riding. Meeting at Thirsk on Thursday morning, the members visited, in waggonettes, the Norman village church of Felskirk, with its well-known monuments of Knights Templars, and the remains of the Commandery at Mount St. John, and then ascended Black Hambledon, some 1,200ft. above the sea level. The moorland village of Scawton was next seen, and then the ruins of Rievaulx Abbey, where Mr. C. C. Hodges and the Rev. J. C. Atkinson, D.C.L., gave explanations. Helmsley Castle and Church were the last places visited, the members staying for the night in that village. On Friday the members left Helmsley early, and went to Swaldirk, after which the church of Gilling was viewed, and also the old castle of the Fairfax family, with its 16th-century tapestry-room. The far-famed ruins of Byland Abbey were then surveyed, and Canon Greenwell gave a history of the ancient pile. Thence the party went to Coxwold, and after looking at the church, they, with interest, examined Shandy Hill, the residence of Lawrence Sterne, and then drove to Thirsk, returning north by train.

The Queen and Royal Family have had a white marble slab placed over the grave of the late Mrs. Hull, formerly nurse to her Majesty, and whose remains are interred, with those of her husband, in Clewer Churchyard, near Windsor. The memorial is adorned with a cross and palm branch.

No fewer than 1,700 soldiers have been for the past three weeks hard at work upon the butts at Bisley, the "New Wimbledon," in preparation for the prize meeting of the National Rifle Association, to be held next July. The two principal butts are fast approaching completion. The larger of these, to be used for the firing between 200 and 600 yards, is intended to provide 90 targets, and the whole of the earth for these long embankments is being dug out and filled up by military labour. The latter comes entirely from Aldershot, the plan adopted being to march out a brigade of three half-battalions of 500 men each, these remaining at work for ten days at a time, and receiving extra working pay of sixpence per day. The remaining 200 men are supplied by the Royal Engineers, who are occupied with the more important duty of surveying the land and marking out the ground. None of the offices or other permanent buildings have yet been started; but the ground has been set out for them, and considerable progress will be made during the winter by the Royal Engineers.

COMPETITIONS.

SHEFFIELD MUNICIPAL BUILDINGS.—The instructions to architects who may engage in the preliminary competition for this important group of public buildings, as arranged by Mr. Waterhouse, R.A., in conjunction with the committee of the Town Council, have just been published. The Corporation invite, in the first place, sketch designs for the proposed buildings, illustrated by plans of each floor, two cross sections, and an elevation towards Pinstone-street. No alternative schemes are admissible, and if sent will be ruled out of the competition. Each drawing must be to the scale of $\frac{1}{16}$in. to the foot mounted on a stretcher 2ft., by 1ft. 6in. in size; the Surrey-street front being kept to the lower edge of the plans. The walls on plans and sections are to be in black; the elevation in outline only, without colour. Each set of drawings to be sent in anonymously (but accompanied by a sealed envelope containing the author's name and address), and it is sought to maintain this anonymity by discarding the motto system. When each case is unpacked, it and its contents will be marked by the Corporation authorities for identification; but no distinguishing mark, motto, or device is to be put on the drawings, description, statement, envelope, or case by the competing architects or their agents. A plan of the land, showing the levels, positions, and depth of neighbouring sewers, has been issued with the instructions. The buildings, including all breaks forward for architectural effect, are to be kept within the boundary of the site coloured pink. The plot being needlessly large for the accommodation required and money to be expended, it is probable that competitors will be able to show how a portion of it may be left for future extension of the municipal buildings without injuring the light or architectural effect of those now contemplated. As there is a considerable fall in the ground eastwards, those competitors whose designs occupy the whole length of Surrey-street will probably find that a basement or lower ground-floor story can be introduced at the eastern end of the site entirely above the level of the ground. Each set of drawings must be accompanied by a concise explanatory statement detailing the materials suggested, and giving the net cubical contents of the proposed building calculated from the bottom of the footings, and including all walls, roofs, turrets, towers, chimney-stacks, or other special features. Each design must indicate the method of warming and ventilation proposed, either on the drawings or in the description. The total cost of the entire building, including all special features and the necessary permanent fittings, must not exceed £80,000. It is the wish of the corporation that the building should be fireproof, and should be faced with stone of good quality. In all other respects the competitors are left free as to style and material. A schedule of the accommodation required is appended to the instructions, and it is explained that the sizes of rooms therein given are suggestive sizes, absolute compliance with which is not made a necessary stipulation; but a general compliance with these dimensions as indicating the minimum sizes of the rooms, will undoubtedly affect the selection of the design. Each competitor is expected to fill in a schedule, giving the size of every room in his design, and to let it accompany his report. The summary of the schedule shows that these rooms, to be distributed on three floors, will comprise a total floor area of about 14,130sq.ft. for council-chamber, mayor's rooms, and committee-rooms, out of an entire area of about 55,059sq.ft. The corporation will select, with the advice of their assessor, from the sketch designs sent in, those which they most approve, not exceeding six in number, and will request their authors to supply such further plans, sections, elevations, details, and perspective views as may then be required for their more complete illustration. A sum of £600 will be divided equally among the architects taking part in this final competition, or among such of them as shall in the opinion of the assessor have fulfilled its conditions, except in the case of the successful competitor, whose premium shall merge in his commission of 5 per cent. for carrying out the work. The corporation have invited Mr. Waterhouse, R.A., to act as assessor in both these competitions; but they reserve to themselves the right of ultimately deciding which set of designs shall be adopted. All sketch plans to be sent in (carriage paid) addressed to the borough surveyor, Sheffield, on or before the 2nd of December, 1889. It is probable that the day for sending in designs in the second competition will be the 1st of May, 1890.

LEGAL INTELLIGENCE.

FAÇADE SHOPS AT HORNSEY.—At the Hornsey Local Board meeting on Monday week the Plans Committee reported that they had received plans for the erection of three façade shops, Archway-road, by Mr. F. J. Chambers. The ground plan of these proposed shops showed the building line encroached upon; no sanitary accommodation was provided; no plan of the second floor of the middle shop, which was more than one story in height, was given. The drainage was shown grouped and connected to an old drain adjoining. No concrete was shown under the floors. The block plan was not signed. No division fences or walls were shown. No doors or windows were shown in the rear, and in various other minor details the plans did not comply with the conditions of the board's by-laws; therefore the committee disapproved these plans. The board would probably recollect that two similar buildings were erected on the Great Northern Railway Company's property, adjoining Crouch-end Station, by the same architect about two years ago, for which no plans were deposited. It was thought that the buildings were intended for the purposes of the railway company, and were consequently exempt from the provisions of the board's by-laws; when, however, the object of the buildings was ascertained, proceedings were commenced against Mr. Chambers, and finally the buildings were allowed to remain subject to agreement. The committee drew particular attention to this fact, as the buildings in question, which had been likened to rabbit hutches, were without any w.c.'s or sanitary appliances, and were now referred to by Mr. Chambers as a precedent for the buildings he was trying to erect in the Archway-road. The committee recommend that the officers of the board be authorised to take proceedings immediately the works was commenced, as these little huts could be run up in a very short time. The recommendation was agreed to.

FEMALE LABOUR IN BRICKYARDS.—At the Ryedale Petty Sessions at Kirbymoorside on Saturday, Mr. Rickard, Factory and Workshop Inspector, charged George Atkinson, brickmaker, of Kirbymoorside, with employing a girl under sixteen years of age in his brickyard. Defendant acknowledged the offence, but pleaded that he had not received a copy of the Act and rules from the inspector until a few days ago, and the offence was committed a year since. Under these circumstances, the defendant was simply ordered to pay 14s. 6d. costs.

CHIPS.

Christ Church, Weston-super-Mare, was reopened on Sunday, after restoration, including the raising of the roof by 7ft. and the insertion of a clerestory on either side. Messrs. Hans Price and Wooler were the architects, and Messrs. Theodore Palmer and Son the contractors.

The town council of Maidenhead have accepted as a gift for 99 years a public recreation ground of 14 acres, near the centre of the town, offered by Mr. W. H. Grenfell.

On Friday an inquiry was held at Bournemouth by Mr. Thomas Codrington, M.Inst.C.E., Local Government Board Inspector, with reference to an application by the improvement commissioners for sanction to borrow £10,150 for works of street improvement, and £350 for enlarging the refuse destructor. Mr. Lacey explained the works proposed to be carried out, the greater portion of the money being required for laying limestone tarpaving 3in. thick in various parts of the district, and Limmer asphalte in other places where the traffic is greater. It was proposed to add two cells to the refuse destructor, and to increase the area of the hot plate.

The north porch and muniment-room of Manchester Cathedral, erected, from the plans of Mr. J. S. Crowther, to the memory of the late Mr. James Craven by his children, at a cost of £3,300, is now completed, and the ancient registers, which are of priceless value, are about to be removed thither from the Ely Chapel.

The Duke of Bedford has paid £20,000 to the official trustees of the Charity Commissioners towards the building and endowment of an intermediate and technical school for Tavistock, to replace the closed grammar school in that town.

The Court of the Turners' Company purpose holding their annual exhibition of turnery at the Mansion House during the week ending October 26. On the Friday the prize distribution will take place in the Egyptian Hall.

Among the measures which received the Royal assent on Friday was the Technical Instruction Act. A summary of its provisions appeared in our issue of the 2nd ult., p. 163.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

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SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., LIV., and LV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—H. B. and Co.—C. L.—H. P.—B. and P.—A. C. R.—T. W. T.

H. B. W. (No examination is necessary in order to call yourself a civil engineer. There are various societies which conduct examinations for membership to their own ranks. The principal of these are the Institute of Surveyors and the Institution of Civil Engineers, both in Great George-street. Further particulars should be sought of the secretaries. There is also the Sanitary Institute of Great Britain, which is supposed to deal more particularly with sanitary engineering.)

Correspondence.

SCULPTURE AT TRURO CATHEDRAL.

To the Editor of the BUILDING NEWS.

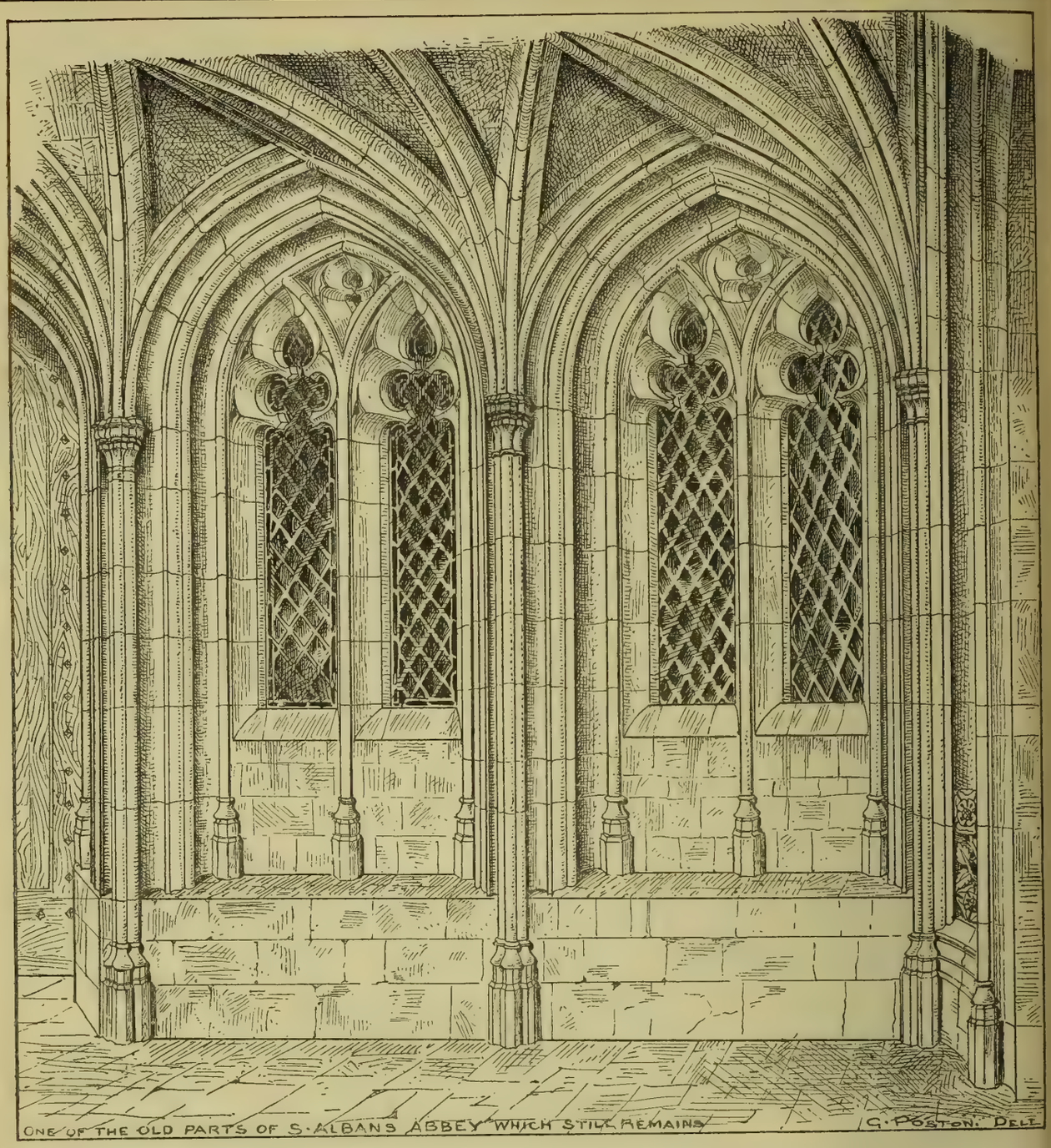
SIR,—"ARS" has been misinformed as to the sculpture at Truro Cathedral. Messrs. Luscomb executed the Bishop's Throne, and the sculptured panel in pulpit is by Mr. Nicholls. All other sculpture is by Mr. Hitch.—I am, &c.,

W. N.

ST. ALBAN'S CATHEDRAL.

SIR,—At last Lord Grimthorpe has done himself justice in his letter to the *Guardian*, published in your last issue, in adding to his gift to the country of a specimen of what a Grimthorpean Cathedral should be, an insight into the wealth of the nation in the possession of himself, the only architect full, not only of art, but of elegance of mind and diction, refinement of wit, of sensibility to the feelings of others, of chivalrous generosity, and of the modesty of true genius.

Were it not for the momentous issue at stake in the St. Alban's controversy, as to whether an ancient monument should be committed to the transcendent genius of Lord Grimthorpe or the "anonymous," "unknown," "mendacious," "spiteful," "despised," "condemned," "impractical," "impudent," "conceited," "incompetent," "impostors" of the Royal Institute of British Architects, the comical element which pervades it would make it a pleasing divertise-



ment to us poor architects who have to live on the contemplation of the honour and glory of the great outsider.

Being of an inquisitive turn of mind, I have been exercised by many questions which his lordship or some of your unenlightened readers may be able to solve. Is Lord Grimthorpe "Ars"? Is "Ars" Lord G.'s *alter ego?* Did Lord G. teach "Ars" the art of writing in the vulgar tongue or *vice versâ?* Is "Ars" one and Mr. Longmire the other of the two most competent amateurs who have "raked" and "exposed the ignorance of the anonymous and unknown architects"? If Lord G. had found one righteous and competent architect, would he have employed him and hidden his own light under a bushel? Would the one righteous and competent architect have accepted a commission from Lord G. if, like myself, he had had the privilege of working under the architect whom Lord G. employed in his unregenerate days? Does an architect's duty only extend to making a general design?

Is a clerk of the works the most competent person to design the details of a cathedral?

Where are all the exquisitely-moulded and carved fragments of the Western portals, which Sir Gilbert Scott considered of priceless value, and hoped to have seen restored to their original position, but which have been put out of the way by Lord Grimthorpe, lest the light of other days should be paled by his effulgence?

Would an exhibition at the Royal Academy of Lord Grimthorpe's rectory at St. Alban's, and sundry "other things," result in the inauguration of a Grimthorpean order of architecture?

Why does Lord Grimthorpe reserve his deadliest darts to shoot at his dead friends, to say nothing of foes?

When will Lord Grimthorpe learn that architecture is not the art of blowing his own trumpet?—I am, &c.,

Arthur Baker, F.R.I.B.A.

Sir,—The above illustration represents one-half of a porch, presumably, which has, up to the present, escaped the destroyer's hand at St. Alban's Abbey. It is situated on the south side, near the Lady-chapel, where a huge new buttress to the right contrasts well with its beautiful Late detail.

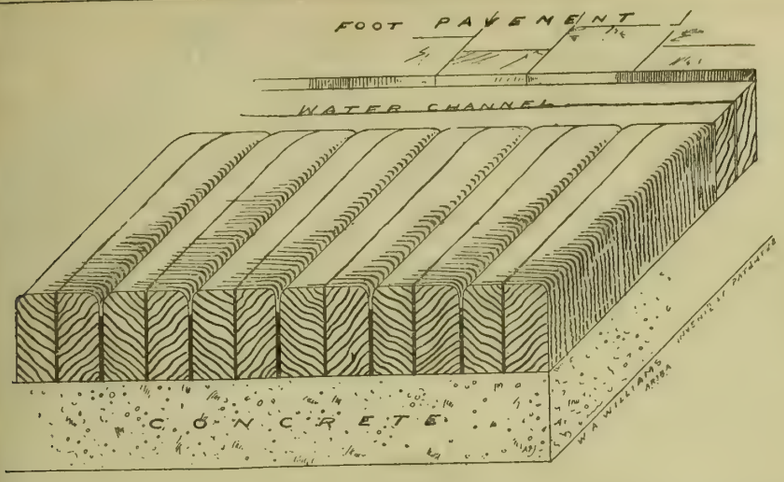
The wonder is, that it has not shared the same fate as the rest of the old work. The only reason one can give (seeing that it is surrounded by new work) to account for its retention is that it contains a doorway which is of great service, probably, in giving access to the abbey.

It is surmounted by a rude brick arch, which spans the entire width, for the purpose of supporting the superincumbent mass of renewed brickwork. The windows shown look into the abbey, the cusps of which have been chopped away.—I am, &c., George G. Poston.

28, Southampton-street, Strand.

Sir,—Permit me to say that I have just received a private communication from "Ars" (Mr. W. H. M. Ellis, Barrister at Law, of Monkstown, Dublin), in which, with the reckless audacity that has characterised the various letters he is the *nominal* father of, he reviews the offensive and utterly untrue personal allusions he had the ill taste to introduce into your issue for July 13th, and the bad manners to substantially repeat in last week's issue.

I am only just home from St. Alban's, and have simply time to point out that as Mr. Ellis has not, I believe, any intimate personal acquaintance with the Abbey, I repeat and emphasise the



last lines of the letter of protest I penned immediately upon my return from Morocco (Building News, 9th August, 1889), these ran:—

"Readers of the Building News are now in a better position than before to weigh his utterances ["Ars"—i.e., Mr. W. H. M. Ellis's] *for precisely what they may be worth.*"—I am, &c.,

Exeter, September 4. Harry Hems.

ARE BUILDERS' PLANS THE PROPERTY OF LOCAL AUTHORITIES?

Sir,—In 1881 the Mayor, aldermen, and burgesses of the Borough of Totnes made certain by-laws, of which the following, clause 92, forms part:—

"Every person who shall intend to erect a building shall give to the sanitary authority notice in writing of such intention, which shall be delivered or sent to their clerk at his or their office, or to their surveyor at his or their office, and shall at the same time deliver or send, or cause to be delivered or sent, to their clerk at his or their office, or to their surveyor at his or their office, complete plans and sections of every floor of such intended building, which shall be drawn to a scale of not less than one inch to every eight feet, and shall show the position, form, and dimensions of the several parts of such building, and of every water closet, earth closet, privy, ash-pit, cesspool, well, and all other appurtenances."

On the 19th ult. I deposited with the borough surveyor the original plans of a building to be erected in this town, on approval. I am now informed by the town clerk that the plans are the property of the Council, and he declines to give them up, so the works cannot proceed. It has been customary hitherto for the plans to be signed by the mayor, returned to the architect, who then deposited copies with the borough surveyor.

I shall be glad to know if any of your readers have been subject to similar treatment; also of an expression of opinion as to the legality on the point. In justice to the Mayor, I may say he was not present at the Council meeting, or this petty way of showing ill-feeling and obstruction to the building interests of the town would not have occurred.

I am told the chairman has initialled every page of the specification and each plan since the meeting, which I suppose is to commemorate his action.

My point is that the original plans are the property of the architect, and that if certified copies are deposited the by-laws have been complied with. My offer to do this has been refused.

At the Mayor's feast, and at all public dinners for years past, it is generally deplored that the lovely sites surrounding this town are not built upon, and we are told that every facility and encouragement is offered to builders. It is so at Paignton and other prosperous towns, but in this ancient borough there is always a spragg ready to be put in the wheel of progress.—I am, &c.,

Totnes, September 2. W. M. Tollit.

WOOD PAVEMENTS.

Sir,—Some few weeks ago you gave an illustration of a new form of wood paving, showing a small iron cross at the corners of the blocks, projecting a little above the ordinary surface of the wood, which was supposed to take the weight of the traffic, and prevent horses from slipping. It appears to me this system might be expensive, noisy, and cause jolting, and certainly in the event of a horse going down, it would injure him in a permanent and serious way.

I inclose you a sketch of a wood pavement which I had laid in Bromley some time ago, and which has given every satisfaction, and stood every test. My idea was taken from the old granite cube paving, which from experience I found the safest to drive over, the horses being able to get a grip between the stones. The next point was to obtain a pavement durable, cheap, and noiseless, with the same foothold. After various trials and experiments, I adopted the form shown, and find it answers the purpose in every way, with the extra advantage of draining the road quickly. The blocks are hardened, creosoted, and placed cross grain up, laid in the ordinary manner, with the exception of the grooves not being filled up beyond a certain point with the composition. After the whole is thoroughly set, sand is thrown on in the usual way, which works into the grooves, partly filling them up, but working out as the pavement wears. There is no jolting, the general surface being perfectly level, and the grooves not wide enough to take an ordinary wheel, and if it were possible to get into one the form of groove would not hold it. Bicycles can ride over it with ease. The pavement can be cleaned and swept with the same amount of labour as the ordinary paving. In the event of a horse ever going down, he can regain his feet without that painful struggle which is of constant occurrence on the ordinary pavement, and is the cause of death to hundreds of young horses through twisted intestines. A glance at the London streets after a shower of rain will show the need for some improvement in the paving. Heavy and constant loads are passing over the pavement laid here, but there is not the slightest mark or indentation on the rounded edge of the blocks, although it is laid on an incline. The life and cost would be about the same as the ordinary wood block.—I am, &c.,

W. A. Williams.

Bromley, Kent, and London, E.C.

At the last meeting of the Govan Parochial Board, the chairman announced that the General Board of Lunacy had sanctioned the selection of the site at Hawkhead for an asylum for the Govan district. The total extent of the ground to be purchased was about 186 acres. Eight architects had been selected to prepare competitive plans of the buildings to be erected.

The members of the London and Middlesex Archæological Society visited Colchester on Wednesday week. Mr. Henry Laver, F.S.A., acted as cicerone, and, after showing the Corporation regalia, conducted the visitors over the Castle Museum, and the ruins of the Augustinian Abbey of St. Botolph, to the restored gatehouse of St. John's Abbey, to Trinity Church, and the Roman gateway on Balkerne Hill, the visit closing with an inspection of Mr. George Joslin's unique museum of Roman relics.

Alterations have been made to the offices of the Mersey Docks and Harbour Board, Liverpool, embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being employed for the extraction of the vitiated air.

Intercommunication.

QUESTIONS.

[10077.]—**Bats in Church.**—Can any reader tell me how to exterminate bats from a church, by poison or otherwise?—E. X. D.

[10078.]—**Priest's Cross.**—Can any of your readers inform me what a "Priest's Cross" is like in design?—J. G. W.

[10079.]—**Assistant Surveyors, R.E.**—Would any of your readers inform me what age you require to be to enter for the above examinations, how often they take place, and at what place?—F. C. L.

[10080.]—**Sooty Bricks.**—In a large house we have lately erected some old sooty bricks have been used, inadvertently, in the inner walls, with the usual result of the stains showing through papered walls. Can anyone of experience be so good as kindly to inform us if there is any chemical that would permanently destroy this evil, or the best way of getting rid of the difficulty? There are too many surfaces in various rooms to admit of cutting them out.—J. W. S.

[10081.] **Half-Timbered Houses.**—Will any courteous reader give the title of a practical treatise (illustrated) on the construction of small half-timbered houses?—Rustic.

[10082.]—**Degree.**—I should like to know which is the best university degree for an architect, to be obtained without attending any college lectures.—B.Sc.

[10083.]—**Noisy Schoolroom.**—I have just opened a new infant school—a large room about 96ft. by 26ft. The roof is ceiled. I find the room exceedingly noisy, the least sound seeming to be greatly magnified. I should be grateful for any remedy suggested.—Manager.

REPLIES.

[10068.]—**Lights.**—A reply to the question asked by "Light" is contained in a great measure in the answers given in reply 10069. The fact that B. enlarged his windows does not, I scarcely think, justify A. in demanding any right to raise his building, should the raising of such building affect B.'s light, which would be difficult to say from the information given, as the distance of the buildings apart is not given. But A. might be able to raise his building irrespective of B. enlarging his windows. If the reverse of this is apparent I would not like to contest A.'s claim.—W. B.

[10069.]—**Ancient Light.**—I would refer "Builder" to my reply to a query on the subject "Right of Light" (which appeared in this column a few weeks ago) bearing upon this question. As before stated, if the raising of the building by A. seriously diminishes or interferes with B.'s light, A. renders himself liable to B. for an infringement upon his right of light. Of course, if A. can prove, or bring sufficient evidence to show, that B.'s light is not materially affected by the raising of the building, it would be difficult for B. to obtain an injunction against A. in the event of the case being tried by law. The fact that C. owns a building intermediate between A. and B. would not affect the question, and the height that A. could raise his building would rather be settled practically than theoretically—*i.e.*, if, on raising the building 6ft., B.'s light is not diminished, the structure might be carried still higher until an infringement would be caused by an additional height, or it might appear that the raising of the building by A. a foot or so would cause an infringement; and as there is no definite or settled regulation upon this point, it must of necessity be decided in this manner. I would further refer "Builder" to a work entitled "Addison on the Law of Facts," which fully deals with these questions of right of light, &c.—W. B.

[10076.]—**Fresco Cement.**—The following facts will supply "Young Architect" with all the necessary information he requires. Fresco cement is a decorative cement, and is used for internal and external work, internal and external decoration. It is the only, properly speaking, "decorative" cement there is. All cements, when perfectly dry, can be painted—that is to say, in oils; but this is purely water-colour decoration, and possesses exceptionally artistic effect. For the purposes "Young Architect" requires in decorating half-timbered work, it is very beautiful, and produces the "enriched plaster work" which "A Lover of Old Work" describes at the "Plaster House, Audley End." It should be used as he suggests, instead of both sgraffito and shingle work, being infinitely superior. In Italy, it is hardly necessary to observe, houses are decorated externally with fresco ornamentation, and this, with the assistance of fresco cement, can be rivalled in England. Architecturally, I feel strongly that all our Domestic architecture in the country and London suburbs should be externally enriched and beautified, and rendered picturesque, with fresco decoration. Gables, panelling, extended friezes, porticoes (in particular) should be beautified in this manner, and relieved of their present flat monotony, and that, of course, can only be done with harmonious colour decoration. Fresco cement should be used as follows:—Leave the brickwork—that is, plain stock brickwork—quite rough; rake out the joints in the usual way; compose the backing of Portland cement and sand, any proportions which will give consistency and strength; and face with fresco cement, same as Keene's or Parian would be used. When white dry, remove the lime from the face—which, of course, kills colour—with a solution of muriatic acid; allow it to stand a time; clean the face off with a hard brush, and proceed as usual with the water-colour decoration, which can be rendered beautiful in the highest degree. With a view to render the colour decoration washable, and able to stand the weather, give it three coats of fixative, a silicious wash. The plastering and decorating is very simple, so simple, in fact, that it seems to me that every architect—at any rate, those who have had some practice at the A.A. Colour Decoration Class—might and should decorate the exteriors *in persona*. Michael Angelo was a fresco painter, and there are fresco painters—architect-fresco painters—at the present time. There should be more. Fresco cement can be obtained from the Fresco Academy, St. James's House, Kensington-square; also fresco colours, specially prepared for

fresco painting; and fixative, a silicious wash to fix the fresco decoration. They also employ artists to execute fresco decoration. I do not think the cement can be got at all cement makers. "Young Architect" will experience no difficulty; practically it is used as Keene's or Parian.—ARCHITECT, Bromley.

[10076.]—**Fresco Cement.**—Your correspondent can obtain fresco cement and such other materials required for fresco painting from the Fresco Academy, which is situated in Kensington-square, adjoining the King's College Department for Ladies; also colours and solid panels, about ¾in. thick, if they are to be built into the wall, as for the panels of a reredos, for which they are extremely useful and appropriate. In his particular case, plaster the front of the house, or such portions as he proposes to decorate, in the usual manner with two coats—not one: first, a coarse coat of grit and Portland cement, and trowel the face (with a wood float) with fresco cement. There is a slight efflorescence of lime, which can be removed with acid—preferably muriatic—from the surface, and the colour decoration (water-colour) executed *ad libitum*, and the ideal of the "ornate house" is practically complete.—PICTURESQUE.

[10076.]—**Fresco Cement.**—As I have used fresco cement for internal decoration, and found it highly satisfactory, I venture a few words in reply to your correspondent, "Young Architect," to inform him of the best method of using it. In decorating the interior of a town hall or restaurant, or the dining-halls of an hotel or a club, it is preferable—much preferable, in fact—to painting in oil on canvas. Oftentimes, in painting the panels to a dining-hall, the difficulties one is beset with in choosing a plaster—and, by the way, I may observe no plaster is satisfactory for painting—have nearly always compelled me to fall back on canvas, which is highly unsatisfactory. An oil painting on canvas can never be seen but from one point of view only—that is, immediately facing it; the reflected light upon the varnished surface renders it absolutely impossible to obtain a comprehensive side-view of the painting. It affords me, therefore, very great pleasure to say a few words as to how to use it, and, at the same time, to bring to the notice of decorative artists the utility of this decorative plaster or cement. If the room has not been plastered out and finished in fresco cement, and there are some panels left to receive paintings or painted subjects, the artist may elect to plaster the wall in the usual way, or—and as I think—to obtain a "fresco canvas," which are made and can be obtained from the Fresco Academy, St. James's House, Kensington-square, W., and fix it *in situ*; finish with a moulding to the adjoining work, and the painting is then movable. If it is preferable to plaster the wall, plaster in the usual way with cement (Portland cement is best) and sand, and finish with a coat of fresco cement; remove the lime with weak muriatic acid, and paint in water-colour. I prefer it to painting on canvas; the surface is absorbent, and can be proceeded with with rapidity, drying almost immediately, and the effect is softer and more architectural than in oils. "Fix" the painting on completion, exercising some care. To my mind, I prefer a fresco canvas, which is inexpensive, light, and portable; and the painting then can be completed in one's studio, which, in many cases, is a great advantage.—DECORATIVE ARTIST.

[10074.]—**Cathedrals and Churches.**—"Young Inquirer" can find plenty of works on the subject mentioned. Bowman and Crowther's "Parish Churches," Brandon's "Analysis of Gothic Architecture," and another, "Parish Churches," the works of the late Mr. Edmund Sharpe and others, for which see "Batsford's Catalogue." There is no history of architecture to be compared to Fergusson's splendid work.—H. L.

[10076.]—**Fresco Cement.**—I advise "Young Architect" to give a new invention a trial. It is a preparation of tufa stone and cement, and strongly recommended by Mr. H. Faija, C.E. I shall be pleased to give further information. The cement as described is not likely to be quite satisfactory.—H. L.

[10070.]—**Staining New Stone to Correspond with Old.**—After trying various mixtures, such as cement and water tinted with colour, &c., and tinted lime-water, for the purpose of staining new to match old stonework, I was never satisfied with the result when closely examined, as the stone always had the appearance of being painted—that is, the "grain" of the stone was covered. With a considerable amount of doubt as to the result, I experimented with a paste and colour—that is, what is sometimes termed "Irish-paste" at damask manufactories. The Irish-paste has a very disagreeable smell when it is being mixed with water and colour; but the smell cannot be traced after it is applied and dried on the stone. The advantages obtained by using this paste are—(*a*) the "grain" of the stone remains quite distinct, and no appearance of painting; (*b*) any variety of colours can be used—red, yellow, green, &c.; (*c*) a second coat can be applied to make spots and stripes; (*d*) rain, frost, or snow will not remove the staining from the stone. A large new addition was treated in this way very successfully about four years ago, and the new, light-coloured stone stained and tinted to correspond with the adjoining masonry—about 250 years old.—W. B.

[10071.]—**White Glazed Brickwork.**—If the white glazed bricks cannot be left white on the elevations and sections, a *light* wash of grey or neutral will do very well. Areas to basement windows should certainly be drained, and it is a good plan to have a yard gulley, with a movable galvanised grating, giving the cement paving a good fall all ways to the gulley.—H. L.

The workshops and premises of Mr. H. Fairhead, builder, in Long-lane, Bermondsey, were destroyed by fire on Tuesday night.

The town of Szegedin in Hungary is threatened by another catastrophe. Its principal embankment, erected after the disastrous floods in 1879 at a cost of two million florins, collapsed on Monday, and is found to require entire reconstruction. It appears that the dam rests on marshy ground, and has no proper foundation. The engineering works were executed under the control of Count Ludwig Tisza, the brother of the Prime Minister.

WATER SUPPLY AND SANITARY MATTERS.

STOCKPORT.—The Corporation of Stockport, at a special meeting on Friday, authorised the purchase of 95 acres of land in the township of Cheadle as a site for works of sewage purification; and Mr. A. M. Fowler, C.E., of Manchester and Stockport, received instructions to schedule the land and prepare the necessary plans, with a view to an early application to the Local Government Board for a provisional order. The land is situated on the banks of the Mersey, a short distance from Stockport. In the event of the scheme for an extension of the borough being carried out, it will be comprised within the future municipal boundary. This action of the Stockport Corporation must influence that of other municipal authorities on the Mersey watershed. The council passed a further resolution on Friday directing that notice should be sent to all the municipal and local authorities above Stockport, informing them of what is being done, and requiring them likewise to take steps for dealing with their sewage before it is passed into the streams. This notification will affect Ashton, Stalybridge, and other towns and populous villages on the banks of the rivers Mersey and Tame.

OUNDLE WATERWORKS.—The Oundle Commissioners, having invited several engineers to send in competitive plans, at their meeting last Monday finally selected a water scheme drawn out by Mr. W. H. Radford, civil engineer, Nottingham, and after receiving personal explanations as to details, they gave the engineer instructions to commence boring operations at once. Mr. Radford reported that the owner of the estate had generously offered to give the necessary land for the works, on condition that Biggin Hall and Biggin Grange are supplied with water free. Mr. Radford's scheme is to sink a deep well and pump the water from the Northampton sand to a summit reservoir, from whence the town would be supplied by gravitation.

CHIPS.

A new scientific thesis, by Professor G. S. W. Tappen, C.E., of King's College, London, on "The Construction of Groined Arches," will be in the hands of the University Press, Cambridge, after the delivery of the lectures in King's College.

The partnership between Messrs. Tudor and Andrews, of Goole, architects and surveyors, has been dissolved.

Mr. Ruskin's Museum at Walkley has been banded over to the Sheffield corporation, on loan, for twenty years. A document, ratifying the loan and giving the corporation immediate possession of Mr. Ruskin's art treasures, was signed on Tuesday by the trustees of St. George's Guild. The museum is to be removed to Meersbrook Hall, a mansion in the midst of a park, which was purchased by the corporation a few years ago.

The will of Mr. William Crockett, formerly of No. 53, King's-road, Camden Town, contractor and builder, but late of Park-villas, Downs-road, Epsom, has just been proved, the personalty amounting to £36,000.

An obelisk commemorative of the Queen's Jubilee is being erected on Dennis Hill, on the south side of the town of Padstow. It is of granite, in large blocks, from the De Lank quarries, near St. Breward, and will be 50ft. in height. Messrs. J. P. and H. Hamilton, of London, are the architects, and Mr. Nicholas Robins, of Padstow, is the contractor.

The new line of railway between Fareham and Netley was opened by the London and South-Western Railway Company on Monday. The new line is a single one. It has been constructed by Mr. H. Lovatt, of Wolverhampton, the contract having been placed in 1886, and the Hamble viaduct was made by Messrs. Head, Wrighton, and Co., of Stockton-on-Tees.

An interesting memorial was erected on Tuesday week on the end of a house in Cross-street, Redruth. It is a granite stone inscribed in lead letters as follows:—"William Murdoch lived in this house, 1782-1798. Made the first locomotive here, and tested it in 1784. Invented gas-lighting, and used it in this house in 1792. Erected by Tangye Bros., Birmingham."

At Tuesday's meeting of the sanitary committee of Bath, the sub-committee reported upon the charges of Mr. E. Balchin, late clerk of works, complaining of arbitrary treatment by the surveyor, and stating that the levels supplied to him for the laying of the Bathwick sewer were useless. The committee considered that the charge of arbitrary treatment was not proven. They agreed, however, to pay Balchin a claim of £1 5s. for overtime, and to give him a testimonial.

By the will of the late Mr. Henry Moody, a Landport timber merchant, whose death occurred last week, upwards of £22,000 has been left for local charities.

Our Office Table.

THE Society which has just been formed for the Preservation of the Monuments of Ancient Egypt comes very late, in many cases too late, into the field, but yet will have many opportunities for useful action. Its primary aim is to raise by subscription a sufficient sum to enable assistance to be rendered to the Egyptian Government in checking the destruction of the tombs, palaces, and other memorials of Early Egypt by or at the instigation of European and American tourists. A director is to be appointed who will make a survey of the ancient monuments, and will appoint a guardian over each. Mr. E. J. Poynter, R.A., the honorary secretary to the society, makes, in his appeal for funds, what will to many be the surprising admission that he has never visited the country whose scenery and customs he has often made the subject of charming pictures, and of whose ruins he has now constituted himself in some measure the guardian.

THE period allowed for lodging objections with the Privy Council to the Royal Scottish Academy's new charter expired on Saturday, and notwithstanding the dissatisfaction expressed by Scotch architects, and the heated correspondence in the Edinburgh, Glasgow, and professional journals, it is understood that none have been intimated. The *Scotsman* intimates that it is possible, when the charter is sent for consideration to a committee of the Privy Council, effect may be given to some of the alterations suggested. It is also understood that the charter will be sent by the Privy Council for the consideration of the Secretary for Scotland and the Lord Advocate before receiving final consent, and, owing to the holidays, it will probably take some time before the necessary formalities are completed.

WRITING to the *Standard*, with reference to the recent theft of the priceless Washington brasses from Sulgrave Church, Mr. J. G. Bradford comments severely on the utter carelessness of the custodians of these interesting memorials—criticism which can be confirmed by all who have sketched or taken rubbings in our churches. Five years ago, he says, he took a rubbing of the brass of Sir Thomas Urswyk, 1470, at Dagenham, in Essex. One of the plates, containing full-length figures of his eight daughters, was quite loose, and Mr. Bradford had to lift it out of the matrix and replace it before taking an impression. He wrote to the vicar at the time, but no notice was taken of his letter. Had the writer been so disposed, he could easily have brought it away in the satchel without the slightest fear of detection. This brass, from a costume point of view, is one of the finest in the kingdom, and on the plate in question are depicted a nun's habit and head gear, two varieties of the butterfly head-dress, and three of the steeple hat. The danger is that the publication of Mr. Bradford's letter may result in the speedy disappearance of the memorial.

A CIRCULAR communication has just been issued by Mr. W. H. Bishop, the Master of the Plumbers' Company, calling attention to the important work that has been carried out by that company during the past five years in advancing technical education in the trade, and securing the national registration of the qualified plumbers throughout the United Kingdom by means of representative district councils. Mr. Bishop remarks that in order to fully effect the important object in view the organisation by which the movement is now being carried on will require the support of legislative enactment, pending which the object is being and may be still further promoted by the voluntary co-operation of the public and their representatives. He appeals to the public generally to aid in the attainment of that object by requiring that all plumbers engaged in the buildings under their control shall be registered men. In adopting this course, all may do so assured that the system which has been organised has the full confidence and support not only of the leading members of the plumbers' trade, but also of the leading sanitarians throughout the kingdom.

DURING the excavations necessary in the rebuilding a portion of Messrs. Stuart, Sons, and Co.'s warehouses, Old Change, Piccadilly, under the directions of Mr. Frank J. Brewer, architect, the workmen came across the remains of a crypt of early date at a depth of about 12ft. below the

rface of the ground. We visited the works, it found that a large portion of the old work id been removed, and the crypt filled up in der to prepare the footings for the new walls. ne of the angle piers of the crypt was visible, id we were shown a portion of the rib of groin hich sprang from the pier. The stone was in a od state of preservation, and the section of rib, mposed of a diagonal and two wall ribs meet- g together, was very sharp, and of simple layed section, obviously of Early English naracter. As a relic of Old London, the dis- very made is of interest. The works are being rried out by Messrs. Dove Brothers, the con- ractors.

The following circular has been distributed mongst the builders of London:—"Probably ou may be aware of a resolution by the Works ommittee of the London School Board, by hich it is proposed to do away with the whole f the local contractors, as at present arranged, nd to place the work of the schools in the hands f the few (about ten) of the very largest uilders, thereby depriving us (the small builders) s ratepayers of a share in the jobbing, repairs, nd other work which is now tendered for ublicly. As this manifestly will cause a gross onopoly, I beg to invite you to attend a meet- ng to be held at the Wycliff Schools, Philip- treet, Commercial-street, E., on Monday, Sep- ember 9th, at seven p.m., to fairly discuss this natter, and take proceedings to prevent the pro- osed monopoly."

Mr. James Hardacre, of Villiers-street, Brad- ord, died on Saturday, aged 51 years. He was son of the late Mr. William Hardacre, builder nd contractor, Bradford, and till recently had ollowed the occupation of stonemason and uilder's foreman, but during the past few years he deceased, in partnership with his brother William, had carried on the business of builder nd contractor established by their brother, Ald. John Hardacre, who retired a few years since. He was well-known in Bradford and district for he active part he had long taken in the temper- nce movement, as well as for his vigorous dvocacy of Radicalism. He was a fluent speaker, nd he had a large degree of popularity among working men. At one period the trade unionists of the town were desirous of sending him to Parliament; and at the general election of 1874 his candidature was decided upon, and subse- quently he was chosen by the Advanced Liberals, along with Mr. J. V. Godwin, to contest the borough against the late Mr. Forster and the late Sir H. Ripley. The result was that the two latter were elected, the voting being—Forster, 11,945; Ripley, 10,223; Godwin, 8,398; Hard- acre, 8,115. He died from hæmorrhage of the lungs, and leaves a widow and six children.

A long and animated discussion took place on Monday in Aberdeen Town Council over the report of the deputation that came to England for the purpose of obtaining information that might lead to the utilisation of the Belgian peal of bells in St. Nicholas Tower, which were hung some two years ago, but have proved a complete failure, both in point of harmony and volume of sound. The committee recommended by a majority that not more than twelve or fourteen of the larger bells be utilised; that if the present clock is not sufficient to bring out the full tone of these bells, a more powerful clock should be procured which will strike the hours and play the quarter-chimes, and that a carillon machine should be obtained for playing the larger bells. The bells have cost up to the present time £3,686 10s. By 12 to 10 the report was adopted, the minority urging that a competent authority should be requested to report on the best mode of utilising the peal.

A new cemetery is being laid out for the Byker and Heaton burial board, on a site 12 acres in extent near the Armstrong Bridge. Mr. J. W. Taylor, of Westgate-road, Newcastle-on-Tyne, is the architect, and the contracts for the drainage, wallings, and erection of superintendent's house and chapels are in the hands of three local firms of contractors.

It is intended to finally close the Historical Museum at the old Guard House at Pontefract Castle on Tuesday next, owing to the small interest taken in it by the public. The museum was opened by the late Lord Houghton some years ago on the Castle Grounds being thrown open as a pleasure resort. The museum, which has been conducted by a private gentleman, contains numerous and most interesting relics of Pontefract.

Trade News.

WAGES MOVEMENTS.

Newcastle and Gateshead.—The masons—numbering about 300—on strike in Newcastle and Gateshead held a meeting on Monday, when it was resolved to stand firm by their demands. Five of the employers have already complied. The rule relating to sub-contracting is a great obstacle in the way of a settlement. No member of the masons' union works for a sub-contractor, and thus such work is lost to the men. Another point in dispute is in relation to the hours. What is wanted is a rule established that in the winter work shall commence at half-past seven o'clock in the morning, and cease at half-past four in the evening.

CHIPS.

Rich-hill Presbyterian Church, co. Armagh, has recently undergone extensive renovations and additions, from plans, &c., and under the superintendence of, Mr. John Boyd, C.E.; the contractor being Mr. Joseph Small, Rathfriland, co. Down, who carried out the several works.

Aughnacloy Presbyterian Church, co. Tyrone, has been undergoing a thorough renovation and additions, &c., and is almost completed. The plans, &c., were prepared by Mr. John Boyd, C.E., F.R.I.A.I., architect, Belfast, and the works carried out under his superintendence. The contract for the building was given to Messrs. Collen Bros., Dublin and Portadown; the heating is by Messrs. Musgrave and Co. (Limited), Belfast.

The ground floor of Hatchett's "White Horse," Piccadilly, erected a few years ago from the designs of Messrs. Weatherley and Jones, architects, is being converted into shops, and the costly fittings of this part of the hotel have been cleared out to make the room required.

Mr. Zaehnsdorf, the well-known bookbinder, is about to erect extensive business premises in Charing Cross-road.

A new fire brigade station is shortly to be erected at Chiswick. A Local Government Board inquiry as to the purchase of a site for the purpose by the local board has just been held.

Mr. John Bourne, of Handsworth, was on Tuesday elected surveyor to the Coseley local board.

A conversazione was held in the Rochdale Town-hall on Tuesday night, to inaugurate the Rochdale School of Art, which is connected with the local technical foundation. The school will be held in a spacious room in the town-hall, and will be fitted up with desks and all necessary appliances. The course of instruction will include all branches, and especial attention will be given to designs, with a view to improve the industry of the town. The vicar of Rochdale offered on behalf of the Ecclesiastical Commissioners a large plot of land in King-street free, on which to build a technical school.

The value has been sworn at £53,785 1s. 3d. of the personal estate in England and Ireland of the late Sir Charles Lanyon, the well-known architect and civil engineer (High sheriff 1876), Mayor of Dublin 1862, M.P. for Belfast 1866-1868, and Grand Master of Freemasons of the province of Antrim, who died on the 31st May last, aged 76 years.

The Library Committee of the Corporation of London have been empowered by the Court of Common Council to devote a sum not exceeding £1,000 in the production of a new work, in two volumes, illustrating, as far as may be from the City's own archives, the history of the City of London from the earliest times. The proposition emanates from Mr. George Shaw, C.C.

The Association of Public Sanitary Inspectors of Great Britain assembled at Folkestone on Wednesday for their annual congress. The Mayor, Mr. S. Penfold, opened the meeting. The chair was occupied by Mr. Hugh Alexander, who gave an address. A paper was read by the Mayor of Hastings from Sir Edwin Chadwick, in which he dealt with the question of the disposal of sewage, giving it as his opinion that the sewage should be disposed of by means of elevation, and not by means of natural gravitation, and discharge into the sea, as was carried out by many places, such as Hastings, and other coast towns. Dr. Fitzgerald and Dr. Bateman read papers upon the sanitation of Folkestone, and the advantages of the town as a health resort. The Mayor of Folkestone afterwards entertained the members of the association and friends, numbering 200, at a luncheon at the town-hall.

Holloway's Ointment.—In stomach complaints, Holloway's Ointment, well rubbed over the affected part, gives the greatest ease, prevents congestion and inflammation; checks the threatening diarrhœa, and averts incipient cholera. The poorer inhabitants of large cities will find this remedy to be their best friend when any pestilence rages.—[Advt.]

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

Armley, Leeds.—For house, Crab-lane. Mr. F. W. Rhodes, Upper Wortley, architect:—

Accepted tenders:—

Mason and bricklayer:—

Preston, H., Holbeck	£295	0	0

Joiner:—

Stead Bros., Upper Wortley ...	135	0	0

Slaters:—

Atkinson, J., and Son	27	8	0

Banstead.—For new billiard-room to Castleton, Banstead, Surrey, for Mr. J. Jaques. Mr. W. H. Woodroffe, A.R.I.B.A., architect:—

Downs, W.	£630	0	0
Parker, G.	630	0	0
Taylor, W.	624	10	0
Young and Lonsdale	602	0	0
Sanders, E. W....	587	0	0

Catford, S.E.—For making sundry alterations and additions to the St. Lawrence's mission rooms, Brookdale-road, Catford. Mr. H. T. Bonner, A.R.I.B.A., 29 and 30, King-street, Cheapside, architect:—

Jerrard, Lewisham	£180	0	0
Laird, Catford	161	0	0
Robson, Lewisham	147	10	0

BROMLEY, KENT.—For making sundry alterations and building a new billiard-room at the Beech Tree, Bromley, Kent, for Mr. C. Wall. Quantities supplied by Mr. H. Dow-White, 15, New Broad-street. Mr. H. T. Bonner, A.R.I.B.A., 29, 30, King-street, Cheapside, architect:—

Holloway, Deptford	£1,321	0	0
Shewbrooks, Bromley	1,117	0	0
Payne, Bromley	1,070	0	0
Jerrard, Lewisham (accepted)	1,043	0	0
Robson, Lewisham	927	0	0
For pewterer's work:—			
Brown, Camberwell (accepted)	116	0	0
For stained glass:—			
Summers, Lee (accepted)	41	0	0

BROMLEY, KENT.—For 1,390ft. lineal of 9in. stoneware pipe sewer in Bird-in-Hand-lane, &c., for the Bromley local board. Mr. H. S. Cregeen, surveyor:—

Catley, A. T.	£300	0	0
Adams, T.	295	0	0
Bell, G.	281	0	0
Woods and Co.	279	0	0
Drury, H.	270	12	9
Lansbury, T.	214	0	0
Palmer, A.	205	0	0
Peill, E., and Sons (accepted)	190	0	0

Surveyor's estimate: £241 7s. 6d.

BROMLEY, KENT.—For making up Blyth-road, for the Bromley local board. Mr. H. S. Cregeen, surveyor:—

Woods & Co., Englefield-road, N.	£1,360	12	2
Mowlem, J., & Co., Westminster	1,106	0	0
Adams, T., Kingsland	1,098	3	11
Bell, G., Tottenham	1,096	0	0
Catley, A. T., Lloyd-square	968	0	0
Peill, E., and Sons, Bromley	940	0	0
Lansbury, T., Bromley	937	7	10
Palmer, A., South Hill (accepted)	900	0	2

Surveyor's estimate: £1,006 18s. 2d.

BROMLEY, KENT.—For making up a portion of Highland-road, for the Bromley local board. Mr. H. S. Cregeen, surveyor:—

Woods and Co.	£520	0	0
Bell, G.	446	0	0
Adams, T.	427	10	5
Mowlem, J., and Co.	410	0	0
Catley, A. T.	380	0	0
Lansbury, T.	372	17	10
Palmer, A.	365	19	4
Peill, E., and Sons (accepted)	363	0	0

Surveyor's estimate: £399 18s. 4d.

BROMLEY, KENT.—For making up Weston-road, for the Bromley local board. Mr. H. S. Cregeen, surveyor:—

Drury, H.	£453	14	0
Woods and Co.	429	5	2
Catley, A. T.	422	0	0
Bell, G.	406	0	0
Adams, T.	397	0	8
Mowlem, J., and Co.	382	0	0
Lansbury, T.	330	10	8
Peill, E., and Sons	330	0	0
Palmer, A. (accepted)	324	19	9

Surveyor's estimate: £393 7s. 6d.

BROMLEY, KENT.—For making up Weston-grove, for the Bromley local board. Mr. H. S. Cregeen, surveyor:—

Woods and Co	£317	2	16
Drury, H.	307	12	10
Bell, G.	291	0	0
Adams, T.	290	9	10
Mowlem, J., and Co.	285	0	0
Catley, A. T.	276	0	0
Peill, E., and Sons	250	0	0
Lansbury, T.	247	12	2
Palmer, A. (accepted)	232	3	4

Surveyor's estimate: £277 6s.

BROMLEY, KENT.—For making up Moreland-road, for the Bromley local board. Mr. H. S. Cregeen, surveyor:—

Woods and Co.	£447	15	6
Catley, A. T.	444	0	0
Adams, T.	431	17	4
Drury, H.	421	1	11
Bell, G.	415	0	0
Mowlem, J., and Co.	402	0	0
Lansbury, T.	345	14	0
Peill, E., and Sons	242	0	0
Palmer, A. (accepted)	324	16	10

Surveyor's estimate: £378 15s. 4d.

BROMLEY, KENT.—For the construction of a new road, 330ft. in length, in the College Field, for the Bromley local board. Mr. H. S. Cregeen, surveyor:—

Bell, G.	£381	0	0
Woods and Co.	363	19	10
Catley, A. T.	360	0	0
Adams, T.	336	5	8
Mowlem, J., and Co.	320	0	0
Peill, E., and Sons	285	0	0
Palmer, A.	277	10	7
Lansbury, T. (accepted)	275	17	2

Surveyor's estimate: £316 9s. 10d.

BELTON.—For a small farmhouse, for Sir S. B. Crossley, Bart., M.P. Messrs. Bottle and Olley, Gt. Yarmouth, architects:—

Leggett, J., Yarmouth	£582	0	0
Bork and Beech, Yarmouth	498	0	0
Bedwell, A., Lowestoft	475	0	0

CADOXTON, GLAM.—For sinking a well at Biglis, and laying water mains at Cadoxton and other parts of the district, for the Barry and Cadoxton Water Co.:—
Aird, J., and Sons, London (accepted.)

CAMDEN TOWN.—For various additions to the Royal Agricultural College, Camden Town. Mr. A. Vernon, 26, Great George-street, Westminster, architect:—

Holland and Hannen	£1,469	0	0
Bywaters	1,335	0	0
Stuart (accepted)	1,253	0	0

CHARLTON.—For a pair of houses at Dean's-common, Charlton, for Mr. G. Chapman. Mr. T. Dinwiddy, F.S.I., architect:—

Kennard Bros.	£900	0	0
Martin	849	0	0
Leug (accepted)	845	0	0

CHERTSEY.—For repairs and painting to six cottages, for Mr. Day, Chertsey. Messrs. Waterer and Sons, surveyors:—

Knight and Son	£112	0	0
Nesmyth, H. G.	60	0	0
Blayney, J.	55	10	0

CROYDON.—For the erection of small house, Drummond-road, Croydon. Mr. H. Gough, Station-road, West Croydon, architect:—

Smith and Bulled	£385	0	0
Page	373	0	0
Bennett	346	0	0
Saunders*	330	0	0

* Accepted as amended, £300.

DEPTFORD.—For alterations and additions to Messrs. Stone and Co.'s premises, Deptford. Messrs. Stock, Page, and Stock, architects. Quantities by Messrs. Linsdell and Giffard:—

Chappell	£1,988	0	0
Wells, B.	1,777	0	0
White, A., and Co.	1,698	0	0
Pritchard	1,695	0	0
Greenwood, J. and J.	1,680	0	0
Rider and Son	1,658	0	0
Nightingale	1,643	0	0

DEPTFORD.—For alterations at the One and All wharf, Creek-road, Deptford, for the Horticultural and Agricultural Association, Ltd. Mr. J. J. Downes, 11, The Parade, Lewisham High-road, S.E., architect:—

Lorden, W. H., and Son	£489	0	0
Jerrard, S. J.	459	0	0
Holloway, H. L. (accepted)	380	0	0

DERBY.—For erection of boilers and various machinery in laundry, Derby Union. Messrs. Coulthurst and Booty, 4, Albert-street, Derby, architects:—

May and Son, London	£795	0	0
Manlove, Nottingham	715	0	0
Weedham, Derby	712	15	0
Jerram, Derby	666	0	0
Benham and Sons, London	654	19	6
Abell and Son, Derby	650	0	0
Haslam, Derby	600	0	0
Bradford, Manchester	595	15	0

FARNBOROUGH.—For alterations and additions to schools at Farnborough, Kent, for the Farnborough School Board. Mr. St. Pierre Harris, 1, Basinghall-street, E.C., and Orpington, Kent, architect and surveyor:—

Lowe, R.	£1,549	0	0
Ottway, J.	1,376	0	0
Payne, W.	1,312	0	0
Arnaud and Son	1,300	0	0
Crossley, T.	1,289	0	0
Owen	1,278	14	0
Somerford and Son	1,242	0	0
Knight, T.	1,159	0	0
Holt, W.*	1,100	0	0

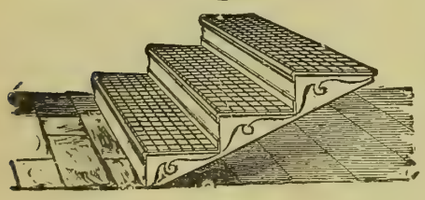
Durtnell (declined).
* Accepted conditionally.

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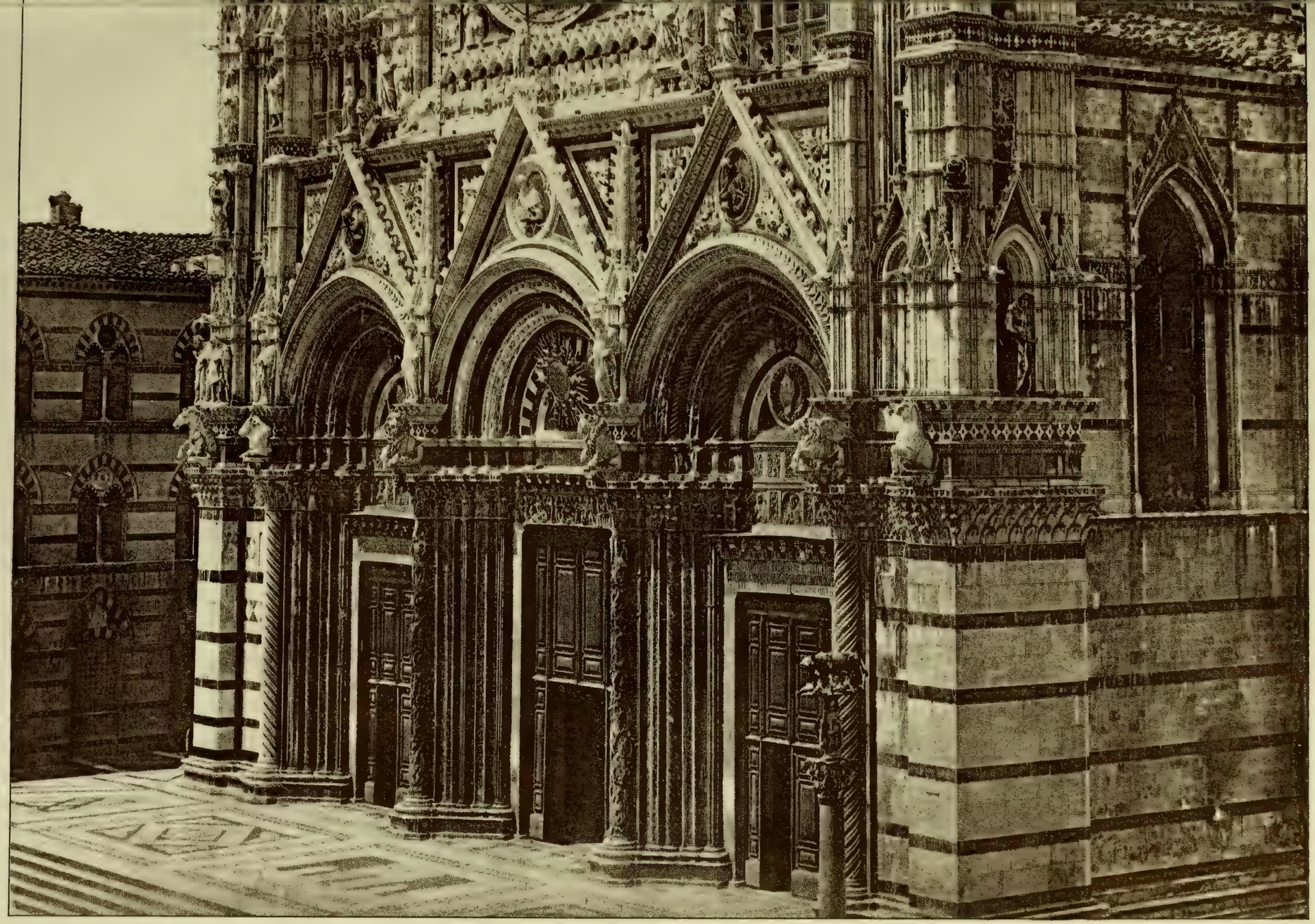
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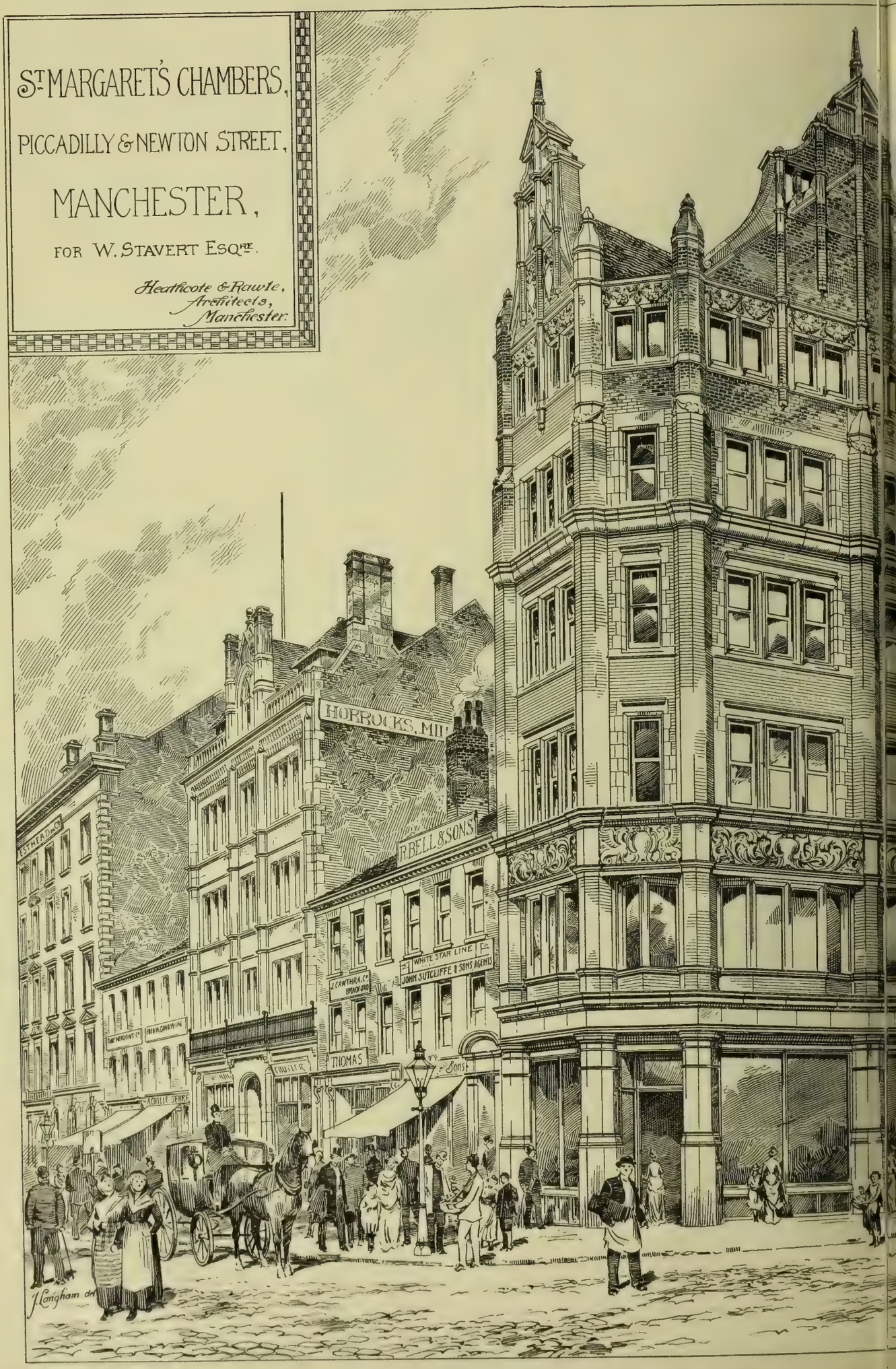
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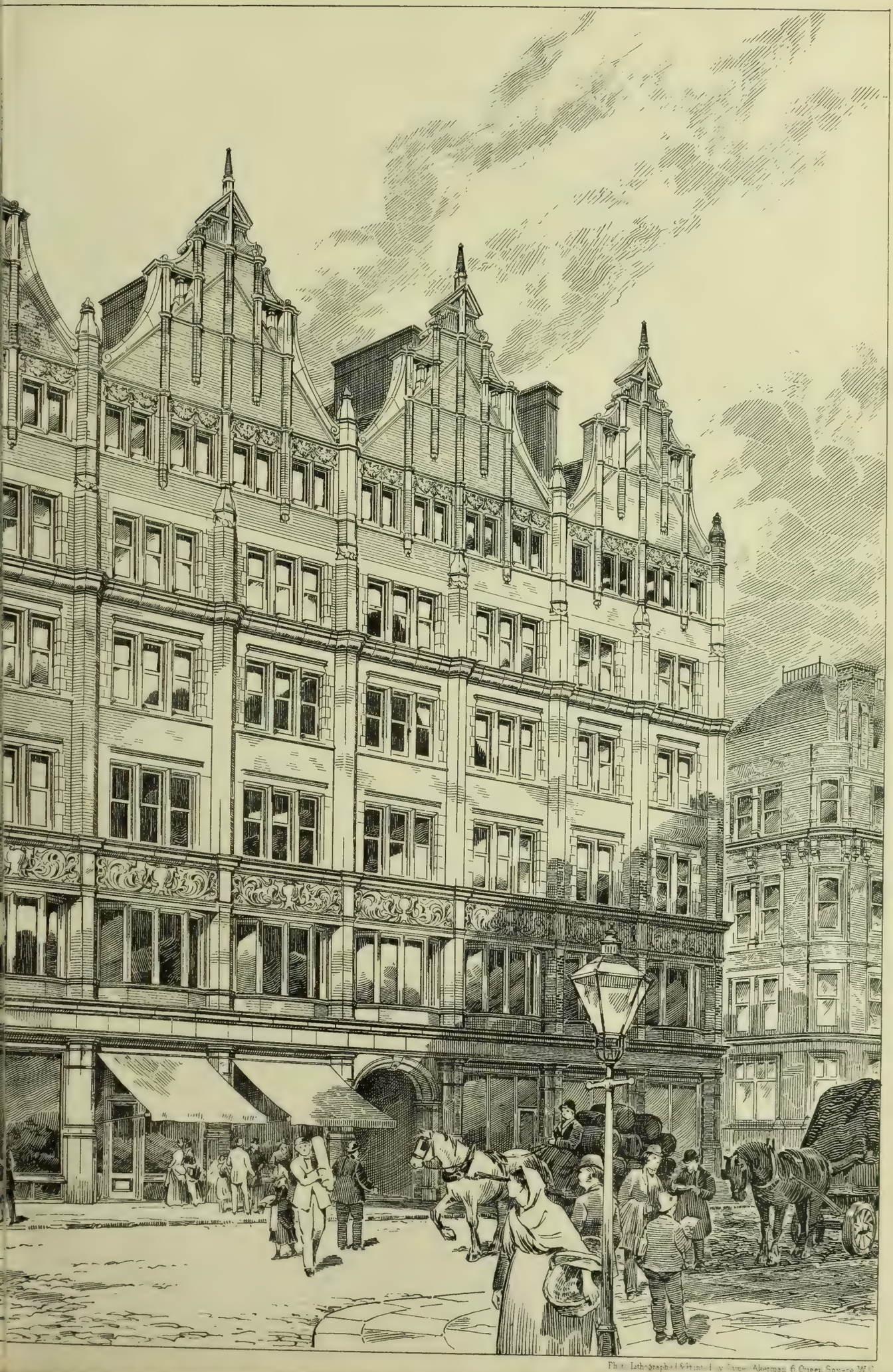


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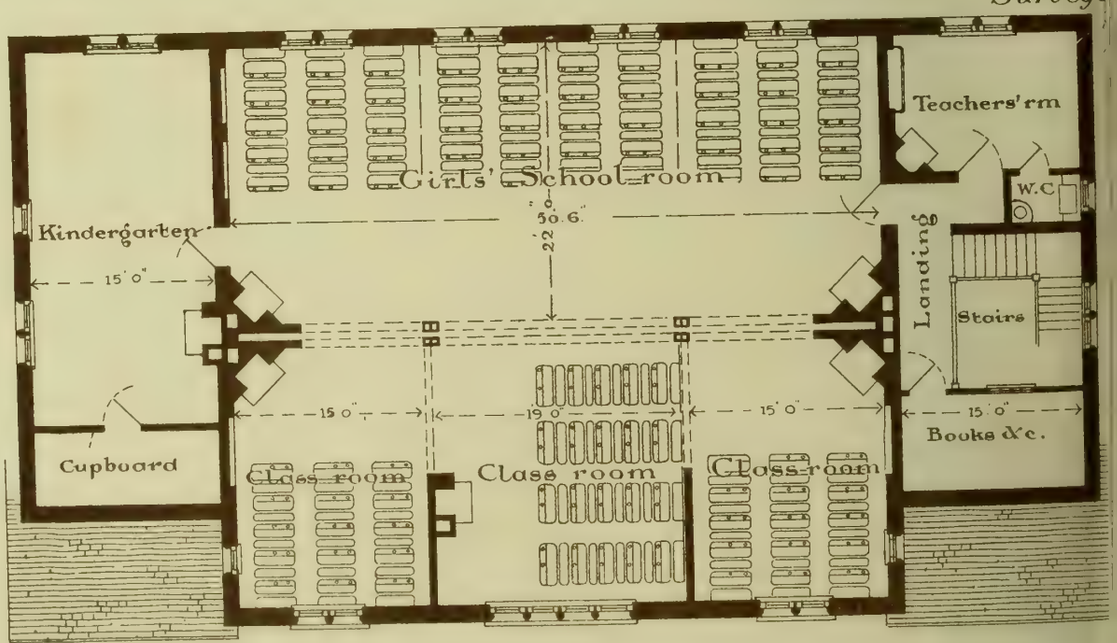
Cross Section A

Longitud

PRACTICAL ARCHITECTURE WITH DETAILED

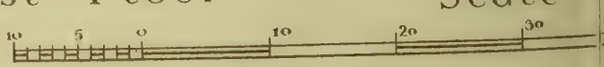
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First Floor

Scale



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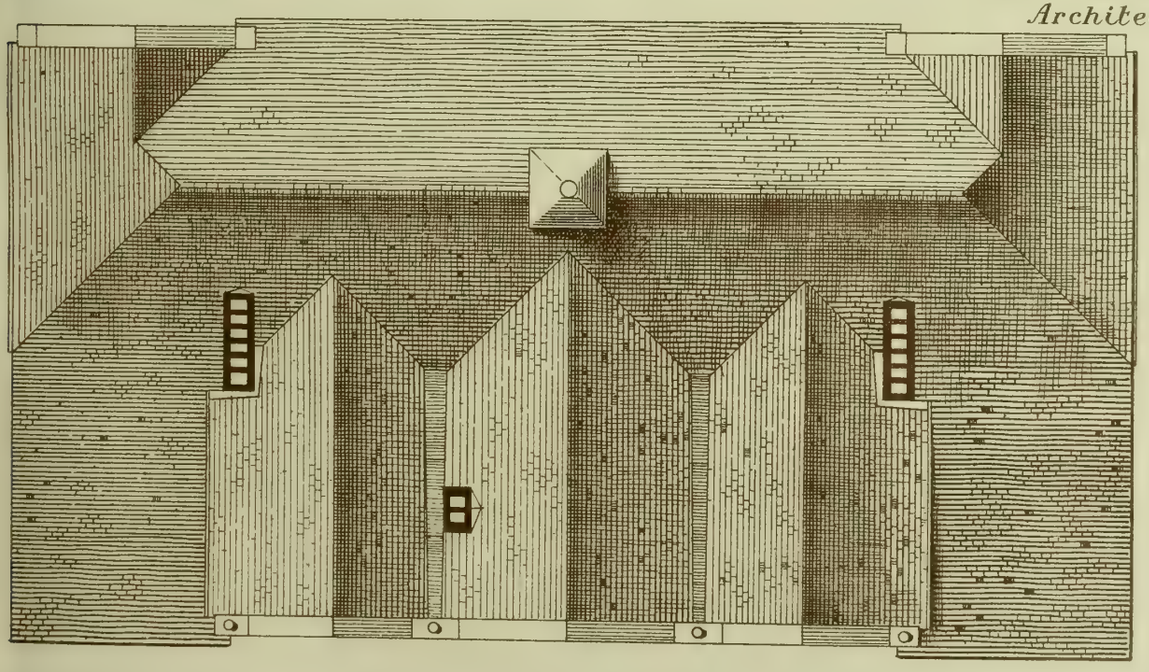


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End Elevation

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Roof Plan

50 60 70 80 90

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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1810.
FRIDAY, SEPTEMBER 13, 1889.

RIGHTS OF LIGHT.—A RECENT DECISION.

THE difficulties attending the reconstruction of large buildings have been greatly increased by the demands made for light by adjoining owners. When an individual pulls down his premises for rebuilding, the neighbours on one or both sides naturally look out that no injury is inflicted on them. If their property is "ancient" as regards right of light, they can compel the building owner to respect their right to the admission of daylight; if the adjacent houses are of recent construction, they still exercise a watchful eye in seeing that the new building does not infringe or take advantage by introducing new windows by which the building owner can acquire a larger easement. We are now referring to buildings erected near to, but not touching, the premises on either side; those in short where side windows are introduced, the light for which must come over the buildings adjoining. Even in the Metropolis, where the law of party-walls prohibits the opening of windows in the side walls, there are instances where a right of light has been acquired and windows have been made in these walls.

One of the first duties of any person who contemplates rebuilding his premises in these circumstances, whether it be a house or a factory, is to find out whether he has an inalienable right to the light on either side or in front of him—whether that right is extinguished. He should do his best to ascertain any easement which his neighbours possess before he commits himself to opening new windows or to raising his building, for if he does not, he may find that he is debarred from proceeding under heavy damages or a lawsuit. Either his neighbours at the side have a right to the admission of light coming over his land and he cannot put up a higher building, or he can build as he pleases without interruption and defy them to add to their houses in any manner that will obstruct the light coming to his windows.

A very momentous decision affecting the builders of new premises under certain circumstances has been given at Birmingham before Mr. Justice Hawkins in the action of Barlow and Others v. Ross, a report of which we lately gave. The defendant had erected a warehouse, 63ft. high, on a site of ground purchased under the Birmingham Improvement schemes, and opposite to premises in Crooked-lane, which were erected in 1867. The latter were of three stories. As the site of the new warehouse was originally occupied by two series of buildings of only 46ft. and 18ft. high, the premises of the plaintiff were well lighted, but, owing to the greater height of the warehouse, the tenants in the opposite houses suffered great inconvenience through loss of light, and their gas bill had been almost doubled. The premises were alleged to be worth £50 a year less in consequence of the obstruction. No notice was taken by the defendant of the complaint made by the plaintiffs; he now denied that there was any obstruction; that if there was, plaintiffs acquiesced in it; and that if there was an obstruction, he was relieved of any reponsibility under the 20th section of the Artisans' Dwellings Improvement Act, 1875, by which all claims of easement over land purchased under it were extinguished. The answer of the plaintiffs was that the land on which the obstructing warehouse was built was purchased by the Corporation in 1877, but the right of light to the houses did not accrue till 1887, in which year the 20 years' enjoyment of light was completed. They admitted that if the defendant had caused an obstruction before the right of light had accrued, the defence would have held good; but the section did not provide for rights which accrued after the date of purchase. Thus, as the judge remarked, the right may have been accruing for 19 years and 11 months at the time of purchase, and yet, because the obstruction was not developed within the last month, the right of light would not be affected. The jury found a verdict for plaintiff for £100, £5 rental capitalised at 20 years' purchase. His lordship then delivered judgment on the other defences set up. Remarking on the alleged acquiescence of the plaintiff, and that the defendant could have erected his building so as to prevent obstruction if the plaintiffs had not acquiesced, his lordship said he did not think there was that amount of acquiescence and consent on the plaintiffs' part. "If a plaintiff found a defendant erecting a building which would obstruct his light, and he knew the defendant was not aware of it, and yet permitted him to continue the work in ignorance and without giving him notice, it would be inequitable to allow the plaintiff to turn round afterwards and insist on the building being taken down." Upon these grounds the judge found for the plaintiffs. There could be no doubt as to the justice of this ruling, as the plaintiffs had given notice to defendant to desist from raising his building beyond a certain height, and warned him if he went farther that he would be liable for compensation. A more cogent defence set up was upon the legal point that the right of plaintiffs ceased on the purchase of land by the defendant of the Corporation, who had acquired it under the powers of the Artisans' Dwellings Act for an improvement scheme; and such right of light, if any existed, was extinguished by the 20th section of that Act. Upon this point his Lordship said: "When they considered the object of the Act, and the intention of the Legislature, it seemed to him the defence ought to prevail. The object of the Legislature clearly was that when a local authority purchased land for the purpose of the Act, all rights and easements in or over the land should be absolutely extinguished, so that upon the purchase being executed, the local authority might consider themselves as being in possession of the land absolutely unfettered." This view was confirmed by Vice-Chancellor Hall, in the case of "Badham v. Morris," decided in 1882. Mr. Justice Pearson in another case held the same view. No actual right was acquired at the time of purchase by the local authority. The plaintiff's building was erected in 1867, and the site was purchased in 1877, therefore only ten years had elapsed from the erection of the plaintiff's building to the purchase of the defendant's site. We again quote his Lordship's remarks as important: "It followed that in 1877, when the purchase was completed, there was no absolute and indefeasible right of the plaintiffs to the light, because they had only been in the enjoyment of it for ten years. He did not say that if for a period of twenty years after a purchase by a local authority that authority was to allow the land to remain vacant, a man who enjoyed the light for that twenty years would not have an absolute right; but he did not think a man could add such enjoyment of the light as he might acquire after the purchase to the enjoyment of the light which he had before the purchase, so as to make up the period of twenty years, and give him absolute and indefeasible right." The Legislature intended that all rights accruing and actually in existence should be extinguished. "His opinion was that the object of the Legislature was to deliver over the land free and absolutely discharged from every right or accruing right on the day when the purchase took place, and not to allow the term during which a man might have enjoyed the right short of twenty years to be taken into account in considering the question of right after the purchase was made. On these grounds his judgment was for the defendant." The plaintiffs gave notice of appeal.

We have here hopes for those who buy from corporations under improvement schemes, but poor consolation for those who have enjoyed a right of light for many years less than twenty over opposite buildings, and then find it is suddenly cut off. Had the twenty years of light actually been enjoyed uninterruptedly before the building was put up, there would have been a good case for the plaintiff; but the fact was, the right had not accrued when the site was purchased. The 20th section of the Artisans' Dwellings Act says that upon the purchase by a local authority of any lands required for the purpose of an improvement scheme "all rights of way, rights of laying or of continuing any pipes, sewers, or drains on, through, or under such lands, and all *other rights or easements* in or relating to such lands shall be extinguished subject to the provision that compensation shall be paid by the authority to all persons proved to have sustained loss." It is clear that the judgement in this case rests upon the incontestable condition that twenty years of uninterrupted enjoyment must have been proved, and that no one could establish that term by adding two periods, one before and another after the purchase, together. Yet this is the kind of opposition which building owners on newly-acquired sites have to be prepared to face.

They purchase an old property with some old cottages or low-built premises, over which there is a right of light to an adjoining or opposite building, and are practically prevented from raising or rebuilding their premises. A person, therefore, has an interest in inquiring as to the real facts of the case before he purchases land with old houses on it, as upon the question as to the subjection of the land to any right of lighting depends the real value of the property. Strange it is to find men buying old property subject to rights of light without knowledge, we mean, of course, land with property adjoining or in immediate proximity. There is, on the other hand, the owner of the dominant tenement, who wishes to maintain his right. His interests are precisely opposite; he has to exercise the greatest vigilance in checking building operations that are likely to affect him prejudicially, and with this object he ought to get his architect or surveyor to make careful plans and elevations of his premises as a record of what actually exists, so that if he should rebuild himself he may do so without committing the error of forfeiting his rights. A gentleman who has rights of light coming over his neighbour's premises thinks of enlarging his house by adding a room at the side; in the new plans the position of his windows is altered. His neighbour, the servient tenement owner, watches the work as it proceeds, and prevents him from claiming for a window placed, say, farther in the rear, and he can sustain his opposition as long as he can prove that the new window is not in the position of the old one, for, as laid down by one case, if the new light does not include the area of the old light, it cannot be affirmed to be a continuance of the ancient light. The dominant owner must not only be prepared in this way by keeping a record of his windows in case he contemplates building, but he ought to look out to see that his light is not obstructed by any building near him. A mistake is very often committed of not obtaining competent advice about intended buildings, and neglecting to give timely notice to the building owner. Each party is too often inclined to act independently of

the other, refusing to take notice, or to enter into negotiations, that would save legal costs. The dominant owner, satisfied of his own rights, is content to allow his neighbour to raise his building till he finds out his mistake, thereby a great expense is incurred that would have been avoided if due notice had been given; on the other hand, we know servient owners willing to run the risk of the uncertainty of the law rather than comply, though they are in a less favourable position to defend an action.

There are many who take the law into their own hands by building-out the dominant owners' windows, on the ground that there has been an interruption in the enjoyment of light acquiesced in by the party for one year. Without, however, positive evidence can be given that such is the case, it is a dangerous proceeding. A person who has enjoyed light through a window for a lengthened period, finds his neighbour has erected a building which obscures the light, and makes complaint to him, he threatens proceedings, but the neighbour takes little notice. A year passes by, and then an action is brought; but the Court rules that there has been a submission within the meaning of the Act. The only safe plan is probably to pull down if that can be done, or to take proceedings before the expiration of a year. Active measures are necessary to prove there is no acquiescence. We will suppose a house, A, has enjoyed light over another, B, for 16 years; both houses are then bought by the same person. In four years he disposes of them to separate parties. Can owner of house A claim a title to the light? No. The unity of possession suspends the acquisition of the right only; but in law there is no interruption. In four years more the owner of the house A has the indefeasible title. Another case is of interest to the dominant owner. An owner, A, has a statutory right to light over his neighbour B's house. Within the prescriptive period A receives additional light by an alteration to another house. B raises his building and diminishes A's light, yet leaving him quite as much as he had before the alteration referred to. The Court held that A had a right to the whole light, notwithstanding some of it had been acquired by the alteration. These decisions of the law affect building operations in country and town. Those who have side windows possessing a statutory right can prevent the raising or altering of buildings on either side, and in the same manner exercise a check on building operations opposite them in streets. The result is to raise the dominant building, and to keep the servient tenement owner in check. In the towns, the effect of this law is more keenly felt, as its operation is more frequently called into play. Conciliation can do much, if only architects, before preparing their designs for new buildings, would study the duties and obligations of property owners and building and adjoining owners. The plans of a new warehouse or city offices are drawn, and tenders received, without a thought of these matters. In the Metropolis the statutory arrangements of party-walls simplify things a little, though many complications and difficulties occur in the design of the back walls and premises in the rear, caused by raising buildings in front, by cutting off an obstructing light through old windows which received light from open areas or over buildings in front of them. For example, it is now almost impossible to preserve a sufficient area between the backs of buildings running in parallel rows or between two streets. Several expedients may be noticed in situations like these by ramping the building behind to admit light to the lower windows of the houses in the rear, by light areas, white glazed bricks, and other devices. Legislation may do something more by determining that every building of a certain height should have an equal area behind it to the back of the rearward premises, and by making a schedule of heights to be observed generally throughout the town.

SCAFFOLDING.

CONSIDERABLE improvements have been made in the construction of temporary erections for buildings. The old fir poles which at one time did service in the erection of ordinary buildings, and which at certain stages were strengthened by ledgers, which in their turn carried the putlogs for the planks, are largely superseded by more modern expedients — notably the upright framework of timbers and gantries, with sheer cranes for lifting. These structures of squared timbers occupy little room, and can be placed within the outer boundaries of the building site, thereby saving outside scaffolding, the occupation of space on the pavement or above the heads of pedestrians, and the risks of accidents by *débris* or materials falling from the platforms. The timbers used in their construction are generally balks, and their design for important buildings necessitates some skill and arrangement. The American builders have become expert scaffold-constructors, and the tall tenement houses and monster hotels have called into requisition the use of gigantic structures which our forefathers would have wondered at. Not only in the temporary framework of timbers, but in the lifting appliances, have there been advances made. The simple derrick, the most primitive hoisting apparatus, which consists of a strong mast or balk of timber kept in position by guy ropes, and having a crab or winch operating on a set of sheave-blocks at the top, was probably the kind of apparatus used in the erection of our great cathedral churches. The substitution of two poles for one, tied together at the top, and slighty inclined and acting as a kind of jib with a guy rope or pole behind, was an improvement, and, in fact, constitutes the principle of the sheers. The lateral stability of the two legs, and the readiness with which such an appliance can be fitted up, has made it of value to the builder who does not wish the more complete form of a crane. It can be easily removed, and the cost is little, only, in fact, the purchase of the winch gear.

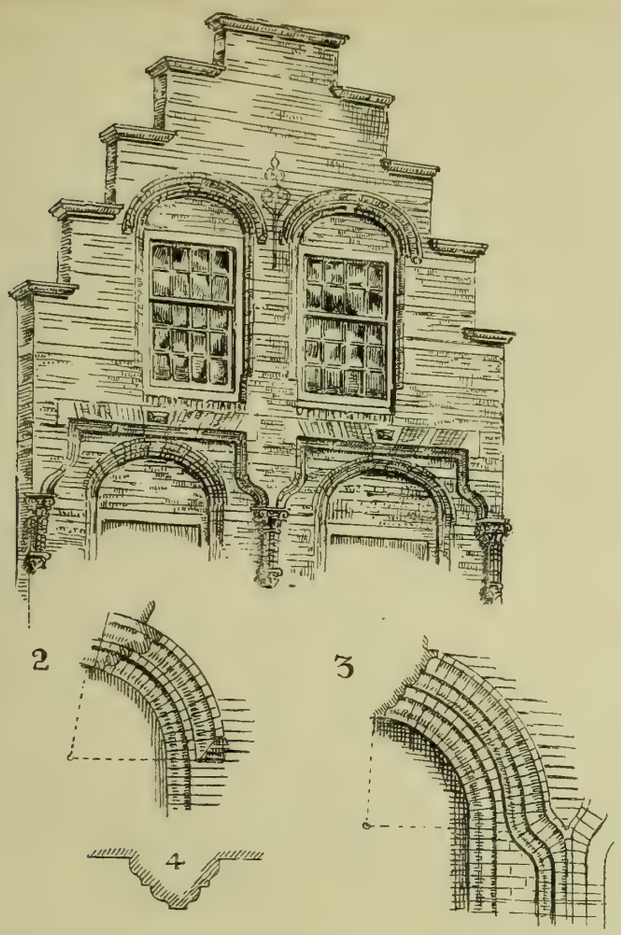
The crane with projecting jib is now the recognised form, and of different patterns, according to the mode of supporting the jib, the most common being a vertical post kept in position by a backstay to the ground behind, or balancing the jib and its load by a weight behind the post, forming a kind of counterpoise or platform. In large works the jib is supported by stays of timber, those being anchored to the base of crane, which is extended on the ground. On plan the two backstays form a square angle, thus allowing the jib and its load to be swung round three-quarters of a circle. The backstays are made to support the upper pivot of the vertical post which revolves with the jib. The steam winch and boiler are often placed on the base as a counterpoise. The lifting power is increased by drawing in the jib by the back chain which holds it to the vertical post, and the inclination of the jib by being raised or lowered increases or otherwise the power in proportion to the radius of the jib. On elevated staging the advantage of thus being able to draw in the load to any required distance is material; the crane commands a wide area or sweep. We believe cranes of this kind are fitted up from £30 to £40 for a ton with a radius of 25ft., and at a proportionate price for greater weights.

There is one great advantage in a scaffolding having the platforms and lifting gear independent of the structure, and placed within the walls of the building. The appearance of the work as it proceeds or rises in elevation can be seen. The old-fashioned scaffold has some advantages, but it obscures the work from below. In the erection of buildings in the North of England and in France this independent method of scaffolding is used, the work is done from the inside, and the materials are raised by cranes. The French "Jenny" is a scaffold on the principle we have described. For expeditious building the independent stage or tripod with crane is indispensable, though there are builders who still claim for the old-fashioned English outside scaffold merits, particularly for buildings of ordinary character. The tripod scaffold is usefully employed where a central court or area allows of its erection within the buildings, or for stone and iron structures when heavy masses of materials have to be raised and swung into position. All danger of overloaded scaffolds is prevented.

ARCHITECTURAL BRICKWORK.—XVIII.

WALL TREATMENT—WINDOWS.

MANY very pleasing arrangements of brickwork may be seen in brick localities such as Suffolk, Essex, and other Eastern counties. In these we find a sort of panelling introduced, already briefly referred to, in which flint in the form of panels occur, and known locally as "flush work." The beautiful churches, chiefly of Perpendicular character, found in Norfolk and Suffolk, are constructed mainly of walls composed of flint and stone, or brick. St. Peter's Mancroft at Norwich, East Bergholt, Woodbridge, and Long Melford churches are of this description of walling, the flint arranged in panels, and the stone appearing as flush tracery, the effect being very much like that of inlaid work, in which the stone represents the inlay. Often we find brick substituted for the panelwork, and the contrast produced by the dark grey flint with the deep red of the brick is very effective. No species of walling is more suitable for ornamental brick treatment, as the brickwork can be introduced to give bond and stability to the flint walling either by being built in the form of solid piers filled in with flint, or merely worked in the surface. In this arrangement architects have a source of relief of much value when large surfaces have to be dealt with, but it is singular we find very little attempt at flush-work in other brick localities. In parts of Hampshire where the flints and chalk crop out, like Winchester and Basingstoke, houses are seen built in this style, the piers and horizontal bands being of brick, and the walling of flint, but the treatment is of a much plainer description, the brickwork being mainly introduced as bond. The brickworkers in other countries have likewise shown their artistic skill in disposing bricks as tracery, the most beautiful examples of this being found in Belgium and Holland, where houses are met with having ornamented cusped tracery, executed in moulded bricks. Examples are to be seen at Bruges, Ypres, Antwerp, Tournai, Gouda, and other cities (see Gailhabaud's "L'Architecture du V. au XVII. Siècle"). In Italy this mode of brick ornamentation was also practised, and Mr. Street has described many beautiful instances. There is a marked distinction between the German and Italian examples, each country developing its own style. The author of "Brick and Marble in the Middle Ages," says: "Italian brickwork is remarkable as being invariably composed of nothing but red brick, with occasional but rare use of stonework; the bricks for the ordinary walling are generally larger than ours, in no way superior in their quality, and not unfrequently built coarsely with a wide joint of mortar. Those used for windows, doorways, and generally where they are required to attract attention and to be ornamented, were made of much



finer clay, and moulded with the greatest care and skill." Moulded tracery work, like that seen in the Low Countries, is not uncommon in Italy; the cusping and trefoiling is cut and rubbed in the common brickwork jointed with the radiating lines of the arch to which it belongs. "In all cases," says Mr. Street, "where brick is used for tracery, it is invariably plate tracery. The tympanum of the arch is filled in with a mass of brickwork, through which are pierced the arches over the several lights of the window, and these are supported on marble or stone shafts with carved capitals, instead of monials." He instances the windows of St. Andrea, Mantua, and the transepts at Cremona. In the first, three cusped circles are pierced in the head of window. Examples of Italian brickwork we shall illustrate; we confine attention here to the relief generally. In our sketch we illustrate the gable front of an old brick house at Dordrecht, dated 1650, showing the common form of stepped gable, with windows executed in fine moulded brickwork. As an example of Dutch gable treatment it has interest; but the points to which we direct attention are the moulded brick window jambs, and the treatment of the front over the lower windows for the purpose of relief. Here, it will be seen, two flat arches are carried by a kind of stilted springing resting on wall shafts, thus setting back the face of wall below. In an adjoining house in Voor-street, in the same city, the window heads are cusped over the square framed sashes. Below the moulded arch the bricks are set with radiating joints, and these are cut and rubbed to a trefoiled shape as in the Italian examples. These Dordrecht houses of the 16th century have many instances of the trefoil-arched head over the first-floor window, also the flat-arch arrangement shown in our sketch. The moulded bricks of the arched window openings are small, about 5in. or 6in. by 2in., and are disposed as indicated in our lower sketches. The favourite bricks are the hollow or cavetto, as in the last sketch, then an ovolo or quarter-round, and round the window aperture the cyma reversed or an ovolo between two hollows.

THE HYDROPATHIC ESTABLISHMENT AND ITS BATHS.*—I.

By R. Owen Allsop, Architect.
Author of "The Turkish Bath: Its Design and Construction."

THE hydropathic establishment exists at the present time in several different forms. From the unpretentious building wherein everything is subordinate to the administration of the water cure, as introduced by Vincent Priessnitz, and modified by Dr. Gully and other fathers of the system, to the elaborate hotel where the name "hydropathic" is adopted mainly to aid its commercial success, there is a regular gradation. In the strictest establishments we find an enforced conformation to certain diet and regimen, inferior only, in point of rigour, to the almost military discipline upheld by Priessnitz at his world-famed establishment at Graefenberg, in Silesia. Descending the scale we find hydropathics where alcoholic liquors are forbidden; others where a few mild restrictions only are placed upon the visitors; and so on, down to the establishment in which the system of baths is only an added attraction, and where the inmates live as free and unrestrainedly as in any hotel. The exact position which any particular hydropathic in this country holds with reference to this scale is dependent upon the nature of the clientèle that its proprietors lay themselves open to attract. As to the type of institution to select as the most desirable, opinions will differ even among serious hydropathists. For the purpose of the present articles, however, I shall keep before me one style of management. Except where referring to existing buildings, or to particularly-named varieties of the hydropathic establishment, I shall keep ever before me an institution seriously hydropathic, and yet one where even the sound and robust visitor will derive rational enjoyment from a stay within its walls. The most desirable type of building for our present purpose will be rurally situated, large, and provided with a very complete bathing department. It will not be a mere hotel, but will seek to uphold its reputation as an honest hydropathic sanatorium. In such an establishment, severe and hopeless disease should be absent; but the invalid and the temporarily broken-down should be able to benefit from the cheerful association of health and vigour. Nothing in its management should interfere with the ease of the sound and hearty; while at the same time the weak and ailing must be protected from the thoughtlessness of health and strength. In a word, it should not be a hospital, but a sanatorium and home of hygeia, such as one may hope will, in the not distant future, exist in numbers near every great city, and increase and multiply in country districts.

The success of the hydropathic system of treatment has been very marked in this country, as those acquainted with existing establishments are well aware. Every year some new feature is added to already extensive institutions. Additional blocks of bedrooms, new reception-rooms, improved systems of baths, and other alterations are continually being effected; and, hand-in-hand with this, the periodical founding of new establishments progresses. Experience has shown that the hydropathic establishment is capable of being made a most gratifying financial success. Fortunes have been made by the owners of such buildings, and are made by those who still pursue a genuine, honest, hydropathic policy. The commercial test of the system of hydropathic treatment has, therefore, been satisfactory. Where failure has resulted it has been through half-hearted attempts, the employment of buildings unfitted to their needs, and through inefficient management. Given a suitable site and a well-planned building, a good and firm manager and a capable and genial resident physician are the main elements that conduce to success. It is to be regretted that failure should be so often due to the employment of buildings unsuited to their purposes. There are, it is true, many excellent establishments that were erected originally for purposes quite different from their present uses as hydropathics, that in every way answer as well as newly-erected buildings. But, on the other hand, unsuitable premises have often been taken, with consequent disastrous result. The excuse urged would doubtless be that the system of cure is so simple that any ordinary accommodation will suffice. Never was a greater mistake made. It is the old story—that, where simplicity is the demand, contempt and neglect are evidenced. To suppose that, because the water cure is the essence of simplicity, therefore nothing but a few ordinarily-arranged apartments are required, with a few extra bath-rooms, is to fall into grievous error.

For, although in the home the elementary appliances of the cure, such as wet-sheet packs, ordinary water baths, and sudorific expedients, may be effectually administered in an ordinary bedroom, yet in an establishment destined, perhaps, to accommodate over a hundred resident patients, at one and

* The strict hydropathist, after perusing these articles, may take exception to my title, and contend that hydropathy, pure and simple, has nothing to do with elaborate bath-houses. It is not, however, my intention to treat of the simple hydropathic remedies; but to describe, for the benefit of the architect, the more complicated bathing contrivances that many hydropathists of the present day claim as justifiable aids to cure.—R. O. A.

the same time, it becomes necessary that specially-designed, and specially-placed rooms should be provided for the different baths and treatments.* And this necessitates a studied arrangement between the bathing department and that portion of the building devoted to the comfort and convenience of residents. Defective approaches to the baths may, small matter as it appears, be sufficient to militate against success. Moreover, the latter-day hydropathist has brought to his aid, and included among his means of cure, more elaborate contrivances than the simple resources of Priessnitz. The Turkish bath has been enlisted, and found to be the most powerful, if not the most efficacious, of all remedial agents of a hydropathic nature. The Russian, or vapour, bath has also taken its place by the side of the former, and is employed, as the case may require, either in conjunction with, or in lieu of, the bath of dry, heated air. Electricity has been pressed into service, as a justifiable auxiliary. The "Pine cure," which has long found such favour in Germany, for the treatment of chest and throat complaints, is also frequently administered in connection with more purely hydropathic remedies. This system of treatment requires "inhalation halls," and *vaporaria* of special construction, to admit of its administration in as effective a manner as at the establishment at Reichenhall, and at several other excellent spas in Germany. Massage baths, pure and simple, are now to be found in many hydropathics. In some institutions medicated baths are considered justifiable; and the employment of the Mont Dore Cure is considered worthy of attention by many hydropathists. The ordinary tonic baths—such as the douche, wave, spray, and needle—become elaborate contrivances in a good hydropathic, and even the true and original water cure, with its packs and bandages, may be in many cases more effectually administered in an apartment specially designed with a definite end in view. And in an establishment of any pretension the above-detailed baths and remedies are not mere makeshifts, make-believes, or expedients. The Turkish bath becomes an affair comprising every feature of a small public bath; the Russian bath is no mere unventilated vapour box, but a light spacious chamber wherein steam is admitted from proper generators. The inhalation hall, of the pine cure, is a roomy apartment fitted up for the purposes of supplying pinal vapour to the lungs of the patients therein. And the tonic bathing appliances and ordinary baths must be arranged with careful regard to these other baths, since frequently a course of treatment involves the concluding douche, spray, or plunge.

Though, for all practical purposes, the hydropathic establishment resolves itself into an hotel *plus* certain baths, it is not sufficient that a building arranged as an hotel should be provided, and a set of baths appended anywhere and anyhow. This is the delusion that has wrecked many ventures, and, indirectly, harmed the cause of hydropathy. The residential portion must be designed at one and the same time as the baths. Arrangements that may pass in hotel planning would be detrimental, if not absolutely impracticable, when employed for a hydropathic establishment. The most marked distinction between an hotel and the residential portion of a hydropathic establishment is that in the former so long as comfort, convenience, and economy go hand in hand, little care is given to matters of hygiene; whilst, in a hydropathic, health matters must take precedence of all others. It is of little use to make a person well by bathing, &c., only to make him ill again by placing him in conditions unfavourable to general healthy living.

Large cities are not the proper places for hydropathic establishments, although even in these positions they often prove successful and the very greatest boon to suffering humanity. It is in the country that the hydropathic is at home. Pure air, bright sunshine, peaceful surroundings, and facilities for exercise in the open, form an essential part of the treatment of the hydropathist. Here the site chosen should be such as is bracing and always salubrious. High-standing grounds are in accordance with the creed of the hydropathist, "*Mann müsz geberge haben.*" The aspect of the building should be carefully chosen, and all the ordinary hygienic rules of house-planning scrupulously observed. It is not a little gain to have a building intended for a sanatorium well placed as regards position and aspect. A cheerful and engaging outlook is of no little moment where the invalid is concerned. Quiet, too, and retirement from a noisy, bustling neighbourhood is a *sine quâ non*. Appearance in these buildings must always be sacrificed, if needful, to comfort, convenience, and health. Economy, too, should be duly observed; for one of the errors too often made in designing a hydropathic, as every other structure, is that the building has been overweighted with ornament and elaborations of all kinds. Many schemes have been launched, only to be ruined because too much capital has been expended at the outset. The enterprise, consequently, was crushed by the heavy first cost, and a good and deserving institution has suffered indirectly. Throughout the whole design of a hydropathic true economy must be studied, if it is to be a financial success; and unless it does prove a success from a commercial point of view, fate decrees that it must sooner or later be abandoned, and its benefit lost to humanity. Simplicity and decent plainness should, therefore, be the rule.

Economy of plan and design is also most necessary in the baths appended to the establishment. The nature of the provision made may border upon the luxurious; but it is of the greatest moment that the different bath-rooms, &c., be so arranged as to admit of economy in attendance. By providing a rambling, desultory suite of bath-rooms, a greatly increased amount of attendance is required for the bathers. So also, in arranging the baths with respect to the residential portion of the building, it is necessary so to plan that the least amount of fatigue may be occasioned to the invalid in gaining the portal of the baths. Throughout the design the baths must be kept in view; this, indeed, constitutes one of the essential differences between a hydropathic establishment and a mere hotel. It must be remembered that many of the visitors and residents will attend the baths several times a day, and ill-planned means of access would be found both inconvenient and hurtful. Moreover, it is desirable that separate approaches to the baths should be arranged for ladies and for gentlemen, separate and distinct corridors and staircases being a great convenience. Ladies, as a rule, do not care to be seen going to, or coming from, the baths. Dr. Gully has gone so far as to express a doubt, in his "Water-Cure in Chronic Diseases," whether it is desirable to have one establishment for both sexes. But, with due attention to the above-mentioned desiderata, every possible objection is overcome.

The general requirements of hydropathic establishments primarily separate themselves into two portions—the residential block and the bathing department. As indispensable additions may be taken the laundry, boiler-room, and engine-house. Attached to the main building, a winter garden is a most useful and pleasing addition. It enables patients to take a due amount of exercise in unfavourable weather. The residential block will include a set of spacious reception and sitting-rooms; all ordinary offices, &c., rooms for management, and a doctor's room for the resident physician, and kitchen and full and complete offices. The public sitting-rooms should comprise a dining-room or dining-rooms, and a drawing-room or drawing-rooms; library and reading-room, smoking-room, and billiard-rooms, not forgetting the ladies' billiard-room. In addition will be required a few private sitting-rooms and private sitting-rooms and bedrooms combined. The public sitting-rooms should be made as comfortable and pleasant as any similar rooms in a high-class modern hotel, though they need not have, and will be better without, their flash and glitter. The inclusion of a large ball-room is a most desirable feature, being of great service for entertainments and amusements of all kinds. If not provided at the outset, it is generally added afterwards, or its pressing want is ever felt. Near the grand entrance hall it is desirable to place a housekeeper's or matron's room. All the conveniences and subsidiary features of a high-class hotel will be included, and, in arranging these, strict attention must be given to every demand of hygienic science. Once more, it must be urged that, throughout the building, health considerations in planning, fitting up, furnishing, heating, ventilating, and lighting, important in every class of building, become doubly so in a hydropathic establishment. Every bedroom must be light, airy, and lofty, and, though varied in point of size and luxuriousness, must be all equally wholesome in their arrangements. Equal study to produce healthful and cleanly arrangements must be evidenced in planning the culinary department and its various offices and appurtenances. It being of the greatest importance that the atmosphere of the building be always perfectly sweet and fresh, regard must be had to precluding any smell of cooking. In many cases the modern plan of placing the kitchen at the top of the house might be followed with much advantage. In addition to the accommodation for male and female domestics belonging to the establishment, and the servants' hall and maids' room, in a high-class hydropathic provision must be made for the servants of visitors. Rooms for private domestics, ladies' maids, a stewards' room, and a *nursery* are indispensable. The latter apartment should be placed as far as possible from the suite of public sitting-rooms, to avoid any possible annoyance to visitors.

The bathing accommodation will, in the least elaborate establishments, consist of ordinary water-baths, and rooms for the administration of tonic baths—douche, spray, &c. In large hydropathics there will be Turkish and Russian baths in addition; and where it is desired to render the establishment as complete as possible in its bathing arrangements, all the baths hereinbefore detailed should be included. The baths will be placed either in a basement, an annex, or a detached building, connected with the main block by ante-rooms or short corridors. For preference, they are much better kept above ground; but site and position, and the peculiar exigencies of each case, may compel other arrangements.

The laundry and washhouse may be most conveniently placed near the baths; and the boiler-room and engine-house also near at hand. By so doing, stoking of boiler and bath furnaces and attention to machinery may be reduced to a minimum. The motive power will be required for electric lighting, which every large hydropathic should adopt, and for driving the laundry machinery, without a full complement of which it is impossible to get through the vast amount of

* No true believer in hydropathy would insinuate that the treatment requires elaboration and expense when on a small scale. The great blessing of the water cure is that, and in its simple and most efficacious form, the poor can treat themselves as effectually as the rich. Compare Note 1. R. O. A.

washing and other laundry-work required in an establishment of this nature.

Further consideration of the planning of the residential and other portions of the building I shall reserve for succeeding articles, in which, owing to the kindness of the proprietors, resident physicians, and architects of the various establishments, I shall be able to give several complete plans of existing institutions. In other articles I shall go fully into the construction of the different baths.

(To be continued.)

LEEDS GENERAL INFIRMARY EXTENSION: SELECTED DESIGN.

MR. GEORGE CORSON, of Leeds, the author of the first premiated design for these buildings, which we now illustrate, in the course of his report to the Infirmary Board, says:—"I have departed in some respects from your instructions, as you left me at liberty to do, with a view to obtaining without restriction the best possible plan. The general disposition of the four principal blocks, as shown in your plan, I have adhered to, as I consider it to be the best obtainable upon the proposed site, taken in connection with the present Infirmary. The level of the floor of the Out-patients' Department, and the connection of the New Pavilion with the present buildings, are the two principal points upon which I have ventured to deviate from the instructions. Instead of fixing the floor level of the out-patients' department at ten feet above the present ground floor, and consequently half-way between the ground floor and the first floor, I have made it level with the first floor, and at the same time I am able to give an entrance to the out-patients on a level with that floor, with the intervention of only one or two steps, or, if necessary, without steps at all. I obtain this, which to my mind is an advantage which will outweigh all other considerations, by placing the entrance gateway some forty yards further up the new street than is shown on your plan, and as that street is on the rising gradient towards the west, I am able to enter from the street on the level. I place, consequently, the entrance for out-patients at the north side, and not, as on your plan, at the east end, an arrangement which will, I think, commend itself. To have adopted the level of 10ft. above the ground floor would have put the out-patients' department in a hole as regards the level of the ground to the north, which would have been from 5 to 9ft. higher on the north front than the proposed floor. It would also have entailed considerably more excavation. The communication by corridors with the present buildings will be, as I have arranged them, on a level, instead of by stairs or "inclines," and will be simply extensions of the present corridors; the present end windows being removed and refixed with the stained glass at the points marked on plan at extremities of corridors. As regards the second point, the connection of the new pavilion with the existing buildings: As the present waiting-room of the out-patients' department will no longer be required, I propose to rearrange that part of the ground floor and to extend the present corridor from entrance-hall (with new rooms to the front), and to continue it along the side of the east pavilion northwards, to connect the kitchen corridor. A cross corridor, from about the centre of its length will be formed across the east pavilion, and a connecting corridor across the intervening court, to the staircase of the new pavilion. In order that the communication for the delivery of stores may be maintained, the cartway is formed at a lower level, so that it passes under the connecting corridor. This can be done without inconvenience as regards levels. As the entrance from Great George-street is nearly 8ft. below the ground floor, the cartway requires to descend from that level only about 2ft. to pass under the corridor, and a corresponding rise brings it up to such a level that a hydraulic lift of about 4ft. vertical will place the stores on the ground floor in the corridor leading to the store-rooms. It will be seen at once that by this "connecting corridor" an easy route is obtained from the infirmary entrance-hall on one side, and from the kitchen department on the other, to the administration block of new wards. It may be thought desirable to provide a direct access on the first floor to the new wards. I have shown a suggestion for a covered bridge of wood and glass to extend from the main south corridor to the connecting corridor, resting upon that and thence to the new wards. The new pavilion wards follow very much in their detail the present ones, the w.c.'s and baths being arranged in angle blocks as in them, with end window between, and the design externally follows the old building. The administration block has on each floor a nurses' room, with fireplace and sink, &c., a room for special cases, a bath-room, and w.c.'s for the small ward, conveniently entered from it by recessing the ward door and taking a passage from it. I propose to have also an intermediate or entresol floor between each main floor, in which I place two rooms for special cases, and one for patients' clothes. A lift for patients is provided in a convenient position in staircase corridor. The large waiting-room is entered, as before stated, from the north side by a covered carriage-porch, somewhat similar but of less dimensions, to the principal entrance of infirmary. I have provided a porter's room adjoining the inner hall; if not required for this purpose, it may be used as a refreshment stall. The waiting-room is 89ft. by 72ft., and is divided, as regards the roof, into what may be called nave and aisles. I do not consider the form of roof commonly understood as a "weaving-shed roof," which you indicate in your instructions, as a suitable one for this apartment. The freedom from the direct rays of the sun which you desire can be obtained by another form of roof, which I have shown upon my sections, and which will look very much better than the "weaving shed" type, and will give ample light to the room. This roof I carry upon four pillars, and longitudinal wrought-iron beams, which support the semicircular iron ribs of the centre bay and the beams of the side roofs. There is no difficulty, however, in constructing the roof on the other principle, if so desired. The north side of waiting-room is occupied by the surgeons' and the eye and ear departments, the patients' entrance being between these. The south side contains the physicians' and the obstetric departments, while the east end has the isolation-room, the w.c.'s and lavatories for men, for women, and for the staff, and the separate stairs for men and women to their baths in the entresol. The west end shows entrance corridors to the medical and surgical departments, and between these a wide corridor for the out-patients to the waiting-room for medicines, in front of the dispensary. The patients on leaving the dispensary hatches pass out by a door on the north and thence to the entrance gate. The surgical department comprises a consulting-room, two examination-rooms, operation-room, two recovery-rooms, and house surgeon's-room. The last three are lighted from the roof, all the others have large windows and roof light in addition. The rooms are all in direct communication with the consulting-room. The physicians' department has four examination-rooms grouped about the consulting-room and communicating with it directly. One examination-room is lighted from the roof, all the other rooms have large windows in addition. A passage from the consulting-room gives access to the house physician's-room, examination-room, and laryngoscopic examination room, all lighted from windows and roof. This department has the general room in the centre, communicating right and left with the optical and the ophthalmoscope-rooms, and by a passage with the operating-room, and its two recovery-rooms. All these have roof lights, except the ophthalmoscope-room, and all have windows except one recovery-room. Shutters or curtains will be provided for darkening the ophthalmoscope-room when required. If a separate communication is thought desirable between optical and ophthalmoscope-rooms, it can be obtained by continuing the passage. The obstetric department consists of a consulting-room and three examination-rooms, all with windows and other lights. The isolation-room at east end is lighted from the roof, but the alternative plan provides for windows in addition. In the waiting-room I have suggested an arrangement of benches for patients in departments, with the porter's desk and ticket-racks in the centre, and the refreshment-stall at end of centre aisle, but this is, like some other points, a matter of detail which can be better settled when the building is completed. As the level of this floor is kept up to that of first floor, I am able to obtain two stories of rooms on the south front. The disinfecting-room and store-rooms occupy the lowest or ground-floor, with a corridor connecting them with the present building, exit to isolation-wards and stair to entresol. In the entresol at the east end are arranged the men's and women's baths, with stairs from waiting-room, and direct exits on the level of street; also a series of rooms which may be either for domestics or for store-rooms. These are approached from main building by a corridor on the half-level, reached from the stairs by the dispensary. The dispensary, with the rooms for dispensers, is arranged at the west end. It is lighted from the roof entirely by skylights facing north, so as to avoid the direct rays of the sun, and is fitted up with shelving, cupboards, and tables. One end is partitioned off and is fitted up with sink, shelving, &c., as a working-room. Two hatches are shown for the out-patients, and one at the north end into corridor for the infirmary medicine. Stairs are provided at both north and south ends in the corridors to communicate with the store-rooms and corridors of ground floor and entresol. The stair at present in the south corridor, east end, I propose to remove, as those I have last mentioned will supply its place in a more convenient situation. The pathological department is placed in communication with the infirmary by a corridor running northwards from the end of the north corridor, on first-floor level, and by another underneath it on ground-floor level. The post-mortem room is lighted by windows on three sides, and by roof lights from the north. The students' gallery is arranged at the end opposite the light, and the students enter by stairs from the corridor. The room is fitted up with operating tables, sinks, lavatories &c. There is a direct communication with the mortuary, but a passage between gives separate access for the operators without passing through the mortuary. The hearse would enter by the out-patients' gate, and the bodies can be removed either by the door from mortuary or by the door in corridor. The laboratory faces north, and is lighted on that side by large windows and by roof lights. It is fitted up with tables and sinks, draught closet, &c., and has a private room adjoining with closet and lavatory. A stair beside it gives access to the cellar underneath, which is also accessible from ground-floor corridor. A waiting-room for relatives, with closet adjoining, is provided, near the mortuary, and a lift from the ground-floor level. The roofs of this department are kept low, so as to interfere as little as possible with the north-east ward, from which it is distant 30ft. The isolation wing is a one-story building, consisting of two wards of four beds each, and a centre block containing the entrance, two rooms for special cases, and nurses' room, with pantry and store-room adjoining. I have kept the wards about 4ft. back from street, so as to be within the railings, and the floor will be about 4ft. higher than the ground-floor of the other buildings, so as to keep it above the level of St. James's-street. The open fireplaces, with down-draught flues, are placed at the ends, and beyond them are end windows, and on each side the water-closets and baths. The lodge is placed near the gates to the infirmary, and has all the requirements arranged on one floor. The heating would be accomplished by 2in. steam-pipes, supplied from present boilers, and arranged in sections, with valves to each section, so as to be able to open, shut, or regulate them independently. I do not propose to place any of them in channels on the floor, as that plan is open to many objections, but to place them all above the floor and along the walls; but in the waiting-rooms it will be necessary to place them above the level of the doorways under the cornice of the aisles. The open fireplaces in the wards will, as in the present building, assist in drawing off the foul air; but in addition I propose to form horizontal flues in the floors between the joists, open with gratings in the walls at each end, and with upcast shafts in the ceilings, with arrangements for gas jets to assist the current. Where the roof is immediately over the room these horizontal flues would be formed in it, and have gablets at each end. I have used this system for a great many years for schools, churches, and other buildings, and find it to be very efficacious. There is a constant draught through the flue when there is any movement in the outer air, which sucks up the foul air from the apartment and occasions no draughts downward. In the waiting-hall and the post-mortem room I propose also to place sunlights in the ceiling, which can be used when required for ventilation purposes. Fresh air I propose to introduce through grated

openings in walls, into flues or vertical shafts, delivering the air into the rooms at a height of 6ft. from floor, so as to avoid dangerous draughts. In the case of the waiting-hall, I propose to form a horizontal flue under the floor to lead the air in from the exterior and to take vertical flues from it, in the walls, as explained above. As all the windows will be made to open, additioual ventilation can be always obtained by these means. The walls are to be built with brick-work faced with pressed brick, and to have sills, heads, and other dressings of Bolton Wood stone. The roofs to be constructed of timber, and covered with dark Westmoreland slates, and the flats and gullies with 7lb. lead. The floors of wards to be laid with oak boards, 4 by 1¼, upon joists 7 by 2. The floor of waiting-rooms to be laid with solid herring-bone oak flooring upon iron joists and concrete. The skylights to be glazed with sheet glass, those of Eye and Ear Department, as well as the windows of it, to be double glazed, with inch space between glass. All doors to be 2in. framed and double moulded, hung with 4in. butt hinges to frames 5½ by 3, and to have locks and fastenings, of average value 10s. a door. The windows to have frames 5 by 3, and casements 2 by 2, Mason's patent, the lower part hinged to sill, the upper part on pivots, to allow of ventilation and cleaning from inside. The walls of isolation room and of isolation wing to be lined internally with glazed bricks, of cream colour, and neatly pointed. All water-closet, lavatory, and bath-room walls to be lined in the same way, and the waiting rooms and corridors to be lined to the height of 6ft., and to have a base and a surbase of moulded or glazed terracotta. The water-closets to be fitted up with Doulton's wash-out closets, without any woodwork inclosing them. The baths to be fitted up with Cliff's solid porcelain baths in one piece. The walls of wards to be finished in Portland cement, and painted three coats in oil. The ceilings of wards to be finished as the walls. The ceilings or roofs of waiting-rooms to be finished with pitch pine. All fireplaces to be fitted up with stone chimney-pieces and wood finishings, and to have front bars and bottom grates only of iron, set with fire-bricks, and glazed brick sides, built at an angle of 45°. The hearths to be tiled, and the fenders to be stone, with grated openings from below to admit air to the fires. I have estimated the probable cost in the usual way by taking the cubic contents of the proposed buildings, and consider that they may be built for the sum you stipulate—viz., £17,000. I do not conceal from you, however, that the greatest economy and circumspection will have to be exercised to attain that result. Mr. Corson's motto was "Lochinvar." It will be remembered that in 1860 a competition of designs for alterations to the old infirmary was held, and Messrs. Lockwood and Mawson's plan was chosen. Ultimately it was decided to build a new one on another site, and Sir Gilbert Scott was given the commission. The present extensions are additions to his buildings.

NEW POLICE OFFICES, VICTORIA EMBANKMENT.

THE extensive and massive-looking building for Police Offices now in progress on the site of the projected Opera House, on the Victoria Embankment, being erected by Messrs. Grover and Sons, has several features of interest to the architect. The basement is of masonry, the upper stories of red brick relieved by horizontal bands of stone. The vaulted offices in the rear of the building, which are evidently to be the depositories of important public documents from which damp must be kept, are covered with Claridge's Pyrimont asphalte, an inch in thickness, in two ½in. layers, for the purpose of rendering the permeation of moisture absolutely impossible. The vaults occupy an area of about 3,000ft. superficial, and are composed of a series of flat segmental arches, the upper surface of which have been entirely laid with this well-known asphalte. We have many times previously insisted on the desirability of covering arched vaults with a layer of Claridge's asphalte, and this recent example of its application for an important building shows how under skilful management and with the best materials the object can be effected. The asphalte has been most carefully applied, and with the neatness of finish which always characterises the work executed by this company.

WAYSIDE NOTES.

THERE is still some real beauty and interest about the Abbey church at St. Alban's. The exterior of the Lady-chapel has yet much that is picturesque about its architecture. In many places its walls are redolent with colour such as the artist loves, and crumbling details and curved enrichments are to be found strangely contrasting with the new work elsewhere. What becomes of this detail? Such is the question that must occur to everyone interested in the "restorations" at the Abbey. Your correspondent Mr. Arthur Baker asks, Where are all the exquisitely-moulded and carved fragments of the western portals, &c.? While at St. Alban's last week I saw many singularly beautiful stone capitals from the inner face of mullions to the clerestory windows of the choir. These windows, as one of your correspondents stated recently, are now being taken out and new windows, with tracery of a different design, being substituted. These old stones are lying about the yards, and one is also tempted to inquire what will become of *them?* Are they to be buried in the walls as so much rough stonework? There are fragments of windows that many would be glad to possess, even if they were not of additional interest from the fact that they formed part and parcel of an abbey which has been ruthlessly pulled about and altered. For my own part I should be glad to possess one of the little capitals as a memento of the building. Lord Grimthorpe might do worse than assort these interesting fragments among us despairing architects.

In the Sheffield Municipal Buildings Competition we shall see the working of the "no motto" principle. It is not very nice for the profession to be thus told to the face that the system of motto-competitions has been so abused by competitors that in the present case the Corporation of Sheffield have decided to hold a competition on a plan that will avoid the objections open to the motto system. Yet this is practically what the Corporation does say. The motto system they believe leads to collusion between competitors and members of the committee who consider the plans. They therefore stipulate that no mottoes will be allowed, and intend to employ the system set forth in the "particulars" or "instructions to architects." These particulars seem to be admirably arranged in every way, and I am glad to see that no alternative designs will be allowed. As we have seen, the system of alternative designs has also been the subject of much abuse. In preparing these instructions, there is much care and thought evidenced. Possibly, as I have said before, Mr. Waterhouse has had the perusal and correcting to do; anyhow, they are something out of the ordinary, and seem to be such as are likely to lead to a successful issue in this competition.

If there is one thing more than another that is objectionable about a competition, it is to have the time extended unexpectedly. This is certainly unfair to the punctual competitor, who has been at pains in getting his drawings finished in good time. It is generally, I believe, the result of a few letters to the competition committee from dilatory personages who find they have put their work off so long that they cannot possibly finish it in time. I am reminded of this most objectionable description of incident by the action of the Borough of Yeovil, who, I see, have put off the date of the sending-in day for the designs for their proposed new Town-hall until the 25th of next month. The Yeovil people may have very good and sufficient reasons for thus delaying; but, as a rule, delays of this nature are to be referred to pressure brought to bear upon committees by the more dilatory of competitors. I should be glad, and all who compete would be glad, to have a complete stopper put upon the practice of postponing the day for sending in plans. There is perhaps nothing more annoying than to prepare one's plans ready for sending in, only to receive a post-card from the clerk to the Corporation of Petty-tweedledum, notifying that the happy day is deferred. That it is genuinely unfair must be admitted by all who look at the question in a proper light. Often, as we know, the time allowed to competitors is but of the most limited description. It therefore is necessary, in order to fulfil every requirement of the competition, that the plans should be prepared in a hurry. A few, however, leisurely prepare their drawings, trusting to being able to induce those in authority to procrastinate for their benefit. The consequence is that, should they be successful, their more finished drawings are seen to greater advantage than those of the architects who have been up to time, and this over and above the advantage gained from a more deliberate consideration of the peculiar problems and conundrums pertaining to the competition.

The School Board for London are, of course, perfectly at liberty to employ whatsoever builders they may choose to do their work, and the builders are perfectly at liberty to make any protest against the arrangements the School Board may make for tendering. On principle, I decidedly object to the step taken by the Board, and fully sympathise with the circular of the London builders. It always seems to me a pity to employ outside labour and capital to the disadvantage of local industries and prosperity. To give a country job, or one in a provincial town, to a firm of London contractors always appears to me to be doing an injury to local interests, although free-traders will hold a different opinion. In the present instance the School Board may have taken a step that has been found highly desirable. Experience may have taught them the trouble that may arise from the placing of large contracts with builders of small capital. Indeed, all architects have something to say as to the troubles they have been led into by employing men of straw. We find builders whom we take a fancy to, and like to give them a good chance by placing big jobs in their hands. The result is often disastrous, and, in the end, he who did the favour receives blame and abuse from the favoured. I have seen it often. A few of these experiences soon harden the heart of the architect, and in future he places no more large contracts with small builders.

There is a class of builder who gives great trouble in this way. He is a good sort of fellow in his way—honest, upright, painstaking, yet lacking the one quality of tact and a faculty for business, that must be part of the character of a successful contractor. But one likes these men; they are the very antitheses of Mr. Buggins. They lead us into endless trouble, however, directly they are trusted beyond a certain sum, and, failing to carry through contracts without innumerable financial muddles, ultimately alienate all our sympathies.

GOTH.

LONDON SCHOOL BOARD CONTRACTS.

A MEETING of builders, convened by circular, was held at the Wycliff Schools, Philpot-street, Commercial-road, E., on Monday night, to consider the action of the London School Board in committee in putting all works of repair to schools into a few large contracts, in place of letting each school separately as before. Mr. Lawrence Stevens, L.C.C., of Rotherhithe, was called to the chair, and congratulated those present on the numerous attendance. Only a hundred circulars were sent out, and between 70 and 80 builders, representing all parts of the Metropolis, were present. He explained that the Works Committee of the School Board had decided to merge all the works at present done by some 140 contractors into the hands of seven large contractors, one result of which would be that, instead of local builders having groups of half-a-dozen schools to keep in repair, one contractor had been assigned 150, and a second 115 schools. The work had been given under schedule prices, but what were called the small men had never had the schedule prices offered them. This was not only a builders' but a ratepayers' question, for in a school in which he was interested the new contractors had to send at least a couple of miles each way to put in two broken squares of glass, and it was self-evident that small repairs could not be done so cheaply by large firms working from a centre, which must be a great distance from some buildings, as by a small man who lived close at hand. Several of the builders present gave their experiences, one saying that he had a large stock of timber and iron work on hand with the Board's stamp, for the repair of desks and seats, and if he lost his work all this would lie uselessly on his hands. Another said he put in a low tender of £38 for two skylights, but he did not get the work, which was given to a firm under schedule prices. Another builder complained that although he had sent to the School Board a list of large works he



"ROCKLANDS," FINCHLEY.—PERCY G. STONE, *Architect.*

had carried out in London and elsewhere, and applied to be put on the list of builders allowed to tender, no quantities were sent him for the next school undertaken, and when he complained he was told that he was not a big enough man. At that very time the Board owed him, for works to several schools under a repairing schedule which he had held for fourteen years in succession, nearly £2,000, and yet did not consider him a man of sufficient capital to carry out a £6,000 school. The tendering was practically a monopoly. A resolution was passed protesting against the action of the Board "in depriving responsible tradesmen of an opportunity of entering into fair competition for work to be from time to time executed," and a large deputation was nominated to wait on the Board, the chairman being requested to act as spokesman.

"ROCKLANDS."

"ROCKLANDS" was built last year for Mr. W. Burnell Tubbs, at Finchley. The ground slopes down to the Dollis brook, and the house being situated on the rising ground, obtains fine views across towards Mill Hill and Hendon. "Heather" bricks are used throughout, with Portland stone for dressings; the roof and first floor being hung with Broseley tiles. The plan with the illustration explains all else.

PERCY G. STONE.

BOOKS RECEIVED.

The Eiffel Tower (London: Sampson Low, Marston, Searle, and Rivington). This is a shilling guide to the Parisian wonder on the Champ de Mars, the author, M. GASTON TISSANDIER, furnishing a popular description of the mode of construction, the uses to which the tower can be put, and the means of ascent provided. A biographical notice of Gustave Eiffel, the enterprising designer, precedes the description of the structure, from which we learn that M. Eiffel was the inventor of a method of raising weights on the slope, for launching straight girders; he was also an expert in iron bridge construction, and at the viaduct of Tardes laid a bridge floor 100 mètres high on piles 104 mètres apart—the greatest span attempted in girder launching. Girder bridges have been a special study with him, and in the construction of arched bridges he has obtained signal success, as in the viaduct of Garabit, in the Cautal, the centre arch of which has a span of 165 mètres, and the height from river to the rail is 124 mètres, high enough for the towers of Notre Dame with the Vendôme Column on the top to stand beneath. It is stated that the Eiffel Tower was divided into 29 sections, and for every one of which "there was a separate working plan, which became the basis of a whole series of geometrical designs, calculated by the aid of tables of logarithms." Each of the 12,000 pieces of metal employed required a special design, in which the "minutest details were mathematically determined, particularly the size and position of the rivet-holes." No less than 700 diagrams were prepared for the engineers in calculating the 29 sections, and 3,000 working drawings; 40 draughtsmen and calculators were employed on the plans for two years. Each piece "was designed, shaped, and bored at the Eiffel workshops at Levallois-Perret, and when it reached the Champ de Mars was found to fit exactly into its place. The account given of the borings and foundations is interesting; compressed air was used in laying the foundations; anchorage bolts 7·80m. long and 0·10m. thick are embedded in the concrete of the piers to insure against capsizing, and to maintain the feet of tower on a horizontal plane the shoes can be lifted by a hydraulic press of 800 tons. By these presses each of the feet of the tower can be moved the necessary height to insert steel wedges. The illustrations of this part render the book of interest to architects and engineers. Views and descriptions are furnished of the caisson used in laying the foundations of piers, the scaffolding used at different dates (these appliances being described in some detail), of the progress of the work, of the cranes for lifting, the staircase and elevators, the Otis lifts and the cages, the Edoux lift from the second stage. Everyone who has visited this great modern Pyramid of iron, as well as those who have not seen it, will find M. Tissandier's little book an instructive introduction and guide. The engravings are numerous. ——*Laundry Management: A Handbook for use in Private and Public Laundries*, by the Editor of the *Laundry Journal* (London: Crosby Lockwood and Son), is a useful repertoire of the requirements of those engaged in laundry work. The processes used in the best English laundries and the building and machinery are described and illustrated with a masterly knowledge. Plans in outline of two model laundries are given, and the instructions under this head, as regards good lighting, ground floor space, and arrangement of the principal rooms and machines, are worth perusal. The book is well printed and illustrated, and all the modern machines and appliances are specially noticed. —— *The Republic of Uruguay.*—A general description and statistical data of Uruguay has just been published gratis, by authority of the Consulate-General in London. It is illustrated by four maps, two colotypes, and nearly sixty zincographs, the latter being reproductions of photographs of the principal buildings and streets in Montevideo. All styles of architecture have been laid under contribution; but most of the large buildings are in some phase of Renaissance. Speaking generally, the treatment is poor, the details are travestied, and the effect is tame and spiritless. —— *Sanitary Hints for Householders* (London, G. Gill and Sons) is a large card containing a code of instructions for the use of householders, compiled and arranged by Mr. G. M. LAWFORD, Assoc.M.I.C.E. The various regulations are classified into general directions to be given to servants, and into matters requiring the personal attention of the occupier of the house, the latter being divided into those needing attention weekly, quarterly, and monthly. Various typical forms of closet, trap, and tap are illustrated. The directions are simple, and the card will be proved useful if acted upon regularly.

The ratepayers of Altrincham have decided by a majority of three to one to adopt the Free Libraries Acts.

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ILLUSTRATIONS.

LEEDS INFIRMARY: SELECTED DESIGN—PROPOSED ENTRANCE-HALL—BURTON-ON-TRENT SEWAGE FARM: NEW HOMESTEAD—CHATEAU DE BLOIS: DETAIL OF PAVILION LOUIS XII.—ST. JOSEPH'S R.C. CHURCH, HIGHGATE HILL.—PASTORAL STAFF FOR LLANDAFF DIOCESE.—SKETCHES IN NORFOLK.

OUR LITHOGRAPHIC ILLUSTRATIONS.

LEEDS GENERAL INFIRMARY EXTENSION: SELECTED DESIGN.

For description, see p. 347.

PROPOSED NEW ENTRANCE HALL.

The above is designed as an addition to an existing building, and it embraces large entrance hall with screen communicating with other apartments. The whole of the woodwork will be ash. The fireplace and chimney breast will be carved out of alabaster, with occasional black Devonshire slabs inlaid. The floor will be broad oak planks, and the ceiling and cove will be of fibrous plaster. The cost of the internal work and decoration will be about £2,500. Our illustration is from a drawing by the architect, Mr. Arthur Marshall, A.R.I.B.A., Nottingham.

NEW HOMESTEAD: THE "ROUND HOUSE," ON THE SEWAGE FARM OF THE CORPORATION OF BURTON-ON-TRENT.

These buildings have been erected on the site of an old homestead from which it takes its name; only the round-house and part of the cart-house stables are left standing. The site is in Egginton parish, close to the Etwall boundary, five miles from Burton, and near to the Half-way Public House between Burton and Derby. The farm consists of about 500 acres. The collected sewage (about five million gallons daily) flows by gravitation to a pumping station one and a half mile from Burton, and from thence is pumped by very powerful engines the remaining three and a half miles to the farm. Roots, rye-grass, and cabbage are the principal crops, large quantities of which are sold on the ground or sent away from Willington and Egginton stations (which are in close proximity), the remainder being consumed in fattening cattle and a few sheep on the farm. The buildings are so arranged that the two covered yards and twenty tie-up stalls can be indefinitely extended without pulling down, the food-preparing departments being of ample size if more produce has to be consumed on the farm. The mixing-room, 40ft. by 30ft., and root-store, 25ft. by 30ft., have rooms over them fitted with the necessary machinery and overhead gearing for preparing the food, driven by an 8H.P. portable engine, the wheels of which rest on cast-iron guide-rails, so that it can be easily drawn away if wanted on any other part of the farm. The upper floor is constructed with 16in. by 6in. rolled iron joists at 10ft. centres, without any intermediate support, and between these 7in. by 3in. bridging joists and boards. The entrance doors are 9ft. by 8ft., sliding, giving free access for horses and carts. The steaming closet, with a capacity of nine cubic yards, is fitted with a perforated tile floor, as used in malt-kilns, and steam is supplied by an inch pipe from the portable engine. The straw-barn is open up to the roof, with sliding door 12ft. high on north side next stack-yard. The forge is fitted up as a blacksmith's and shoeing shop. The two covered yards, 41ft. and 33ft. 6in. in width, have no paving or drainage, none being required. The roofs have pitchpine queen-post trusses, supported where the ends meet by a row of cast-iron columns (which act as rainwater conductors), and a properly arranged gutter in line with the gangway wall. All mangers are constructed with specially moulded Staffordshire blue bricks supplied from the Cliff Works of the Hathern Brick Company. The ground floors throughout (except covered yards and piggeries) are paved with blue bricks closely jointed on Barrow lime concrete. The piggeries have good cement concrete floors floated smooth. The roofs are covered with Broseley tiles, the ridge and ventilators being of a flatter pitch, and covered with a Welsh slate. All water from the roofs is conducted to an underground tank holding 10,000 gallons, whence it is forced by a steam "ejector" to a galvanised-iron tank in the roof, connected by pipes to self-filling troughs in all parts of the buildings. In the stack-yard is a well 225ft. deep for supplementary supply to homestead, and for cottages on the farm. This was sunk and bricked 62ft., and bored to a further depth of 163ft. before water was found. The pump is fixed in the well, worked by wood rods with cast-iron rocking centres and cranks, laid in a trench underground, and driven from the main shaft by the portable engine, the water being pumped to a cast-iron tank above the engine-house, which holds 5,200 gallons. The works have been carried out by Mr. George Hodges, the machinery by Messrs. Buxton and Thornley and Mr. H. Draper, all of Burton-on-Trent, from the designs and under the superintendence of Mr. Richard Waite, architect, of Duffield, Derby.

CHATEAU DE BLOIS: DETAIL OF THE PAVILION OF LOUIS XII. AND DORMER FRANCIS I.

So well-known a building as the Château de Blois has, of course, been frequently illustrated, and in our own pages alone a whole series of drawings have been given, some of which we name below*; notwithstanding this, so rich and diverse are the details of the structure, that an almost endless variety of subjects are furnished by them. We print, for instance, to-day two photographs of portions of the work which are as suggestive as they can very well be, and even to those readers to whom the design is most familiar these illustrations will be correspondingly welcome. The celebrated dormers of Francis I.'s date figure to the left of our plate, and a detail of the angle tower and circular turret at the end of the arcaded pavilion of Louis XII. are shown on the right hand of the sheet.

NEW R.C. CHURCH, ST. JOSEPH'S RETREAT, HIGHGATE-HILL, N.

The above church will be dedicated to St. Joseph, and is to be the great memorial church of the sacerdotal jubilee of the Holy Father, Leo XIII. It has been designed to harmonise with the present "Retreat" so far as the exterior is concerned. The interior will be elaborately furnished with colour decorations and paintings both on walls and ceiling. The dome, which surmounts the entire sanctuary, will be treated in a similar manner. The church provides seating accommodation for about 1,000 persons in the nave and Lady-chapel, the latter of which seats about 100. On each side of the nave is a processional aisle about 6ft. wide, the Lady-chapel being divided from the north aisle by an arcade of six bays equal to three of the bays of the nave. There are nine confessionals recessed in the walls of side chapels and aisles. Six exit doors are provided. The organ gallery over porch is 38ft. by 16ft. The tribune connects the church directly with the choir of the "Retreat." The total internal length of church is 146ft., and the width, including aisles, 55ft. 4in. The panelled ceiling, which is of elaborate design, is 53ft. from floor to internal apex. The tower over the baptistery is carried to a height of 108ft., including the cross. The height of the dome from floor to top of cross is 138ft. The tower cupola and dome are covered with copper. The high altar is dedicated to St. Joseph, in the reredos of which there is the well-known and beautiful painting of the death of St. Joseph, by Monsieur Laby. There are six other chapels. The Epistle side will be dedicated to the Sacred Heart; the Gospel side to St. Paul of the Cross, founder of the Passionist order. The chapel of St. Michael, the principal patron of the order, will have a beautiful marble altar and statue of the great archangel. This altar is now being exhibited in the Paris Exhibition. The architect is Mr. Albert Vicars, of Somerset Chambers, 151, Strand. The work is being carried out by the Passionist Fathers, no general contractor being employed. Brother Alphonsus is acting as superintendent of works, under the supervision of the architect.

* Other illustrations of the Chateau de Blois will be found in the BUILDING NEWS for June 25 and Dec. 3, 1875; Nov. 30, 1883; Nov. 20, 1885; Jan. 14, 1887; March 22, 1889; May 3, 1889; and measured details July 5, 1889.

COMPETITIONS.

YORK BOARD SCHOOLS.—At the last meeting of the York School Board, the chairman stated that seven designs had been received for the proposed school in Shipton-street, the mottoes and estimates being: "Light and Air," £4,060, exclusive of furniture; "Lux," £4,750, exclusive of furniture, which is estimated at between £400 and £500; "Spes," £4,980, including furniture; "Light," £5,500; "Eton," £4,600, inclusive of furniture; "Economy I.," £3,900, exclusive of furniture, estimated to cost £450; "Economy II.," £5,568, inclusive of furniture. As to an assessor, he had communicated with an architect at Leicester, as he thought he was sufficiently distant to be independent of local influence, who had expressed his willingness to do the work for £20 exclusive of travelling expenses. Another way, and perhaps the most expeditious one, was to refer the plans to Mr. E. R. Robson, the official architect of the Education Department, whose sanction would eventually have to be obtained. His fee was £30. He therefore proposed that Mr. Robson be appointed. Mr. Varvill seconded this. Mr. Wragge said there were two points which struck him as being rather singular. The first was that the Education Department should allow Mr. Robson to do such work. It was very much like a judge being the counsel for the plaintiff. It seemed to him to be opening the door for fraud. But that was a matter for the Education Department. He would prefer that they took a separate course. He also thought someone might be got from Leeds, or any other town, who would do the work for £10. It was agreed not to appoint an assessor for a fortnight, so that a committee might first examine the plans, and it was also decided that architects in Leeds, Hull, Manchester, Nottingham, and other towns be written to respecting the examination of the plans. It was agreed to by the Board that no one but members be allowed to see the plans until a selection had been made.

CHIPS.

It is proposed to build a mixed school at High Broom, Southborough, for the accommodation of 250 children. The building will be of local bricks with terracotta dressings. Messrs. Brett A. Elphicke and Albert Howell are the architects.

The church of Chilton Polden, near Bridgewater, Somerset, has recently been rebuilt from the designs, and under the superintendence of, Mr. E. Henry Edwards, of Bristol.

Mr. Oliver Caldwell, M.S.A., has been appointed by the sub-committee of the County Council of Cornwall as architect to inspect and report upon the condition of public buildings in East and North Cornwall for theatrical purposes.

The City Council received on Friday, and adjourned for further consideration, a report by a committee on the Town Hall Buildings and Municipal Offices. The committee recommended the rearrangement of the offices, reconstruction of the council chamber, and other alterations estimated to cost £12,000.

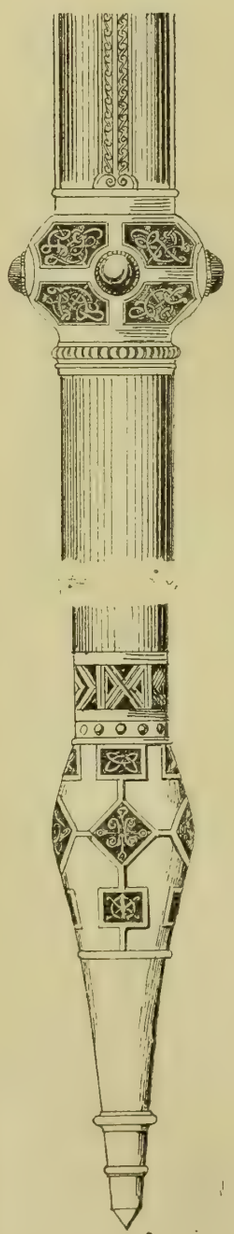
Tanks are about to be made at Avonmouth Docks. Three hundred and fifty tons of steel plate will be required for the construction of them. In the two large tanks there will be 65,952 rivets, and each will weigh 100 tons. These will have a capacity of 600,000 gallons.

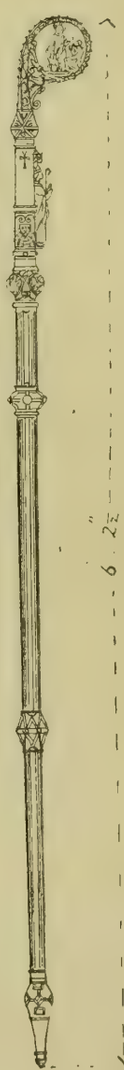
The War Office has appointed a Board of Officers to inspect the buildings recently completed at Caterham for store depôts and other purposes in connection with the defence of London against an attack from the south.

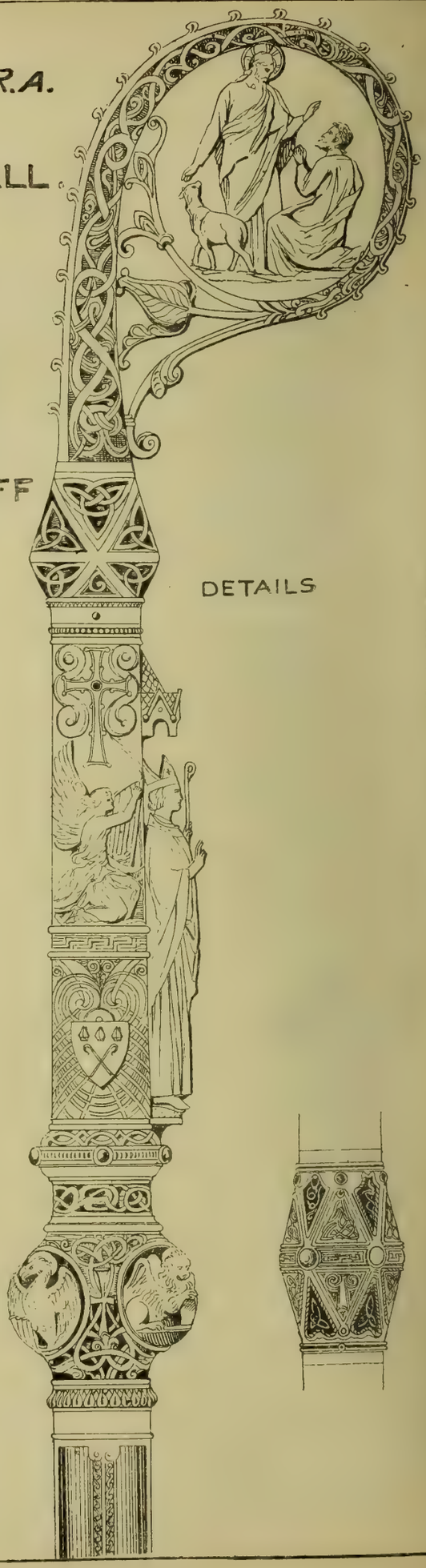
Various alterations and additions are being made at the schools at Winterbourn, near Bristol. Mr. E. Henry Edwards, of 5, Clare-street, is the architect.

SCULPTURE & MODELING
BY HENRY H. ARMISTEAD *R.A.*
CRAFTSMANSHIP BY
MESSRS BARKENTIN & KRALL.
KEMPSON & FOWLER
ARCHITECTS
LLANDAFF.

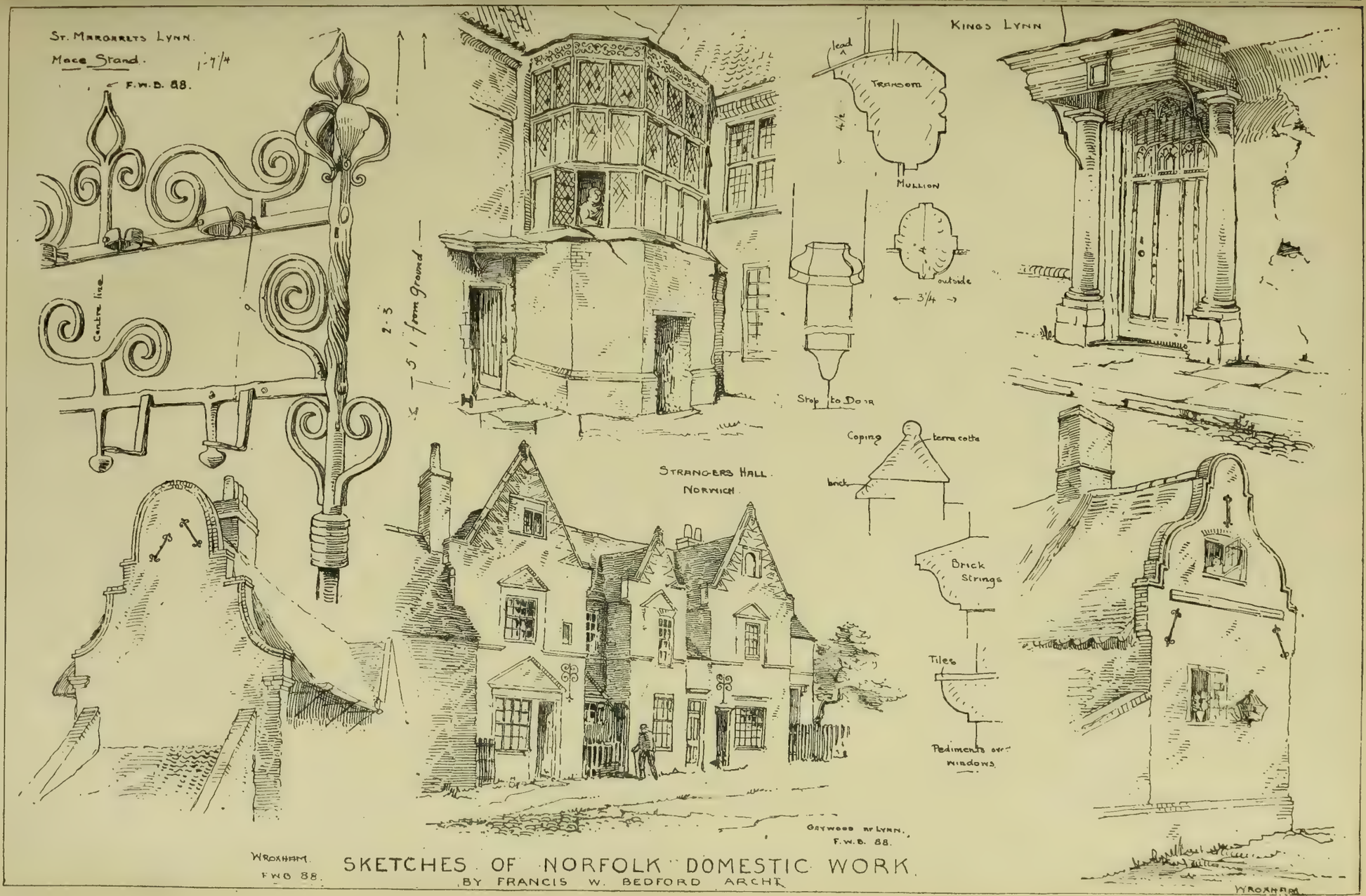
PASTORAL STAFF
FOR
THE DIOCESE OF LLANDAFF







DETAILS



SKETCHES OF NORFOLK DOMESTIC WORK.

BY FRANCIS W. BEDFORD ARCHT.

NEW PASTORAL STAFF FOR THE BISHOP OF LLANDAFF.

MR. F. R. KEMPSON, in his notes on this design which is now being executed, says: "In considering the History of Llandaff in relation to a modern work of art, I have obtained information from which it appears that *circ.* A.D. 177, Pope St. Eleutherius sent St. Fagan and St. Dyfan as Apostles to South Wales at the request of King Lucius (Lleufer Mawr—the Great Light). St. Fagan is believed to have placed his choir—or cathedra—either actually in or near Llandaff. St. Germanus was twice sent by Pope Celestine as Papal legate to Britain, in the 5th century, to check the inroads of Pelagian error. St. Dubricius (Dyfrig) is supposed to have received episcopal consecration from St. Germanus—first as Bishop of Llandaff—but whether as a suffragan (i.e., coadjutor bishop) is not clear. It is believed that he was at first only suffragan to Caerleon, where the bishop of the whole of Wales had his see; he was not strictly the archbishop, but was so called because he had several suffragans (or chorepiscopi) under him. The Welsh bishoprics were not really founded till St. David's time. It is conjectured that these suffragan bishops were also abbots of the greater monasteries of the country, and it is highly probable that Dubricius held such a position at Llandaff, till he became Archbishop of Caerleon; his birthplace is held to be Madley, in Herefordshire, which is within the old diocese of Menevia; he faithfully followed the advice of the Papal legate by founding several large monasteries with colleges attached to them, two of which were in Herefordshire, situated on the banks of the Wye—one at Mocross (now Mocas) close to Madley, the other, the older foundation, Henllan (now Hentland), near Ross. The Synod of Brefi was convened by St. Dubricius. St. David, when he became Archbishop of Caerleon, removed his see to Menevia; probabably this was caused by the perpetual inroads of the Saxons. Menevia was out of their reach, and besides Menevia was St. David's Monastery before he became archbishop—most probably he was its abbot-bishop originally. It was this archbishop who mapped out Wales into sees, almost identical with those of subsequent centuries, save Llanbadarn Fawr, which in the 7th century (or 8th) lost its episcopal rank by reason of the murder of the bishop. A great part of Herefordshire was originally under Menevia; later on it came under Llandaff. Either from neglect or from Norman influence, ground was lost to the see from time to time, and for centuries there were causes taken for settlement to the Pope of disputed jurisdiction in Herefordshire between the three sees.

St. Teilo succeeded St. Dubricius as Bishop of Landaff, and there can be no doubt that he is *the* Saint of Llandaff; his memory has never perished from the spot. I have been told that till very lately the Welsh of the neighbourhood always took their more important oaths in the presence of the tomb of St. Teilo, and although St. Dubricius was a saint of wider influence in South Wales on account of his monastic zeal and devotedness to education, still, locally, as far as Llandaff is concerned, his memory was not cherished like that of St. Teilo, who was his disciple at Mocross-on-the-Wye, and later on the fellow student of St. David at Whitland, in Carmarthenshire, where St. Paulinus (Pawl Hen) had a monastery and college. In the days of his episcopate a direful plague devastated South Wales; the famine that ensued was so serious a calamity that the bishop, accompanied by most of his clergy and people, fled to Brittany. There the saint built a monastery, and amongst other pursuits devoted himself to the propagation of the apple-trees of his native land. With the aid of Dubricius, St. Teilo is said to have established a college at Llandaff called after his name, Bangor Teilo. He, according to one account, was slain by a nobleman in his own cathedral of Llandaff, which church was afterwards frequently called after his name Llan Deilaw. It is stated in Cressy's "Church History" that many miracles were wrought by this saint both in his lifetime and after his death; but the author recites only one, which he gives on the authority of Bishop Godwin, to the effect that after his death the inhabitants of three places contended for the honour of his interment—those of Pennalum, where his ancestors had been buried; those of Llandilo Fawr, where, according to one account, he died; and those of Llandaff, among whom he had been Bishop. When at length no agreement could be effected, there appeared three bodies of St. Teilo exactly resembling each other, one of which was taken by the people of each place. Thus the dispute ended; but Bishop Godwin adds that by frequent miracles performed at his tomb it appeared that the inhabitants of Llandaff had the true body. There seems little doubt that the Cathedral Church at Landaff in St. Dyfrig's (Dubricius') day was dedicated to St. Peter the Apostle solely—the letter of Bishop Urban to Pope Calixtus II., names St. Peter as the original Patron of the Church of Llandaff. A bull of Calixtus II. to Bishop Urban speaks of "the Church of St. Peter and of the holy confessors Dubricius, Teilo, and Oudoceus at Llandaff," hence we must conclude that the above-named saints were joint patrons of the church with St. Peter, and that, probably, long before Urban's time the memory of these three British saints was entwined with every early religious tradition of that church. Therefore, in considering the question of appropriate subjects for a Pastoral Staff for Llandaff there is no lack of choice, yet it is proper to give St. Peter—the original patron saint of the church—a very prominent position. I therefore introduce as the principal subject in the crook of the staff, Our Saviour's charge to St. Peter; and under the crook I place St. Teilo *the* saint of Llandaff, who cared for the sheep of his flock; third, flanking the figure, I introduce two angels praising God on the harp, which is the instrument so dear to the Welsh nation; fourth, on either side of St. Teilo's figure I introduce a cross as the symbol of Faith—above the small angels—Celtic in character, as is the beautiful processional cross of Cong, made originally for the Church of Tuam, the seat of the Archbishopric of Connaught; and it is worthy of note that the old cross found at the Palace Well, Llandaff, is of Celtic character, as are many crosses at Llantwit Major, Margam, and several other places in the diocese; 5th, on the boss I have placed the symbols of the Four Evangelists in repoussé. The form of the earliest staves was that of a walking stick, not more than about 2ft. 6in. or 3ft. long—see bronze staff in the Anglo-Saxon Room at the British Museum, and also the most beautiful Celtic crosier of the Bishops of Clonmacnois. The usual form in England was that of a crook, and the form is desired for Llandaff. I think, however, that the chasing may very properly be of Celtic character to mark the very ancient origin of the see; the bends of the early crooks have a cresting within a clearly-defined line following the curve of the staff and without any crockets, then a cresting of small projections—which do not take away from the form of the crook—came into use, and of these there are good examples at the British Museum. The heavily crocketed and jewelled cresting is later, and not desirable in this case. The crocket, if any, should be small as in the best early work. The entire metal work of the staff is of hammered work in silver, enriched by flat chasings of the ornamental Celtic character. The only portions that are *cast and chased* are the composition of Our Saviour's charge to St. Peter and the figure of St. Teilo. The angels with harps are worked in repoussé, as also the reliefs of the Four Evangelists.

SKETCHES IN NORFOLK.

FROM all accounts, the series of nearly fifty sketches which we have lately published in illustration of the Norfolk Excursion of the Architectural Association held last month has caused considerable interest, and we herewith publish a further sheet of useful studies, contributed by Mr. F. W. Bedford, giving sketches of some more old work from the same neighbourhood. The old red brick and terracotta house at Gaywood, on the outskirts of King's Lynn, is eminently characteristic of the smaller class of manor-house buildings to be found scattered up and down the county, though in the Marshland district specimens like this are not so common as is generally supposed. The building faces the high road as one starts for a walk to Castle Rising, and beyond, perhaps, a chimneypiece or so, there is not much to see of particular interest in the house. The front, too, has been altered and later windows inserted, as the sketch indicates. The solid terracotta copings are similar to those used at Oxburgh Hall, which we likened to Layer Marney in Essex, and East Barsham Hall in Norfolk. The moulded brickwork and raking courses to the gables give interest, and so do the Flemish-looking wrought-iron wall scrolls on the front. The church at Gaywood lies just off the road, and is not worth turning aside to see. By way of comparison, we print two other Norfolk brick gables from an old place at Wroxham. These are more Dutch in feeling, and recent fashion would class them as Queen Anne. The hooded doorway herewith shown was sketched near St. Nicholas' Chapel at Lynn. It contains an original Late-Gothic door richly traceried, and which they say belonged to a college for priests founded by Thomas Thorisby, who was Mayor about 1500. The Strangers' Hall at Norwich, of which a view is given showing the great bay in the courtyard, was built by Nicholas Sotherby, sometime Mayor of Norwich, in 1540. The work illustrates the last stage of Perpendicular work. In the banqueting hall, a fine apartment on the first floor, are an oriel window on the south, and an eastern staircase richly carved with Renaissance detail having an admirably designed string below the balustrade. The roof of the hall is a good hammer-beam one. Above stairs are several rooms with oak panelling and Jacobean plaster ceilings. Tradition tells that this strangers' hall was the guest-house of the Duke of Norfolk; but those learned in such matters say it may be taken as a very valuable example of a merchant's house of Henry VIII.'s time, rendered more interesting by the addition of rather later fittings. The building is situated in a court off St. Andrew's-street. The mace stand figuring herewith is from that most noble church of St. Margaret at King's Lynn.* As a specimen of wrought iron-work, this example is useful, and the object represented is archæologically curious. Some good detail drawings of the chancel side screens of this church would be valued by our readers. The grotesques which they illustrate are quite a study of figure-carving in wood, while the screens themselves are admirable instances of their kind. The brasses in the church are the largest and finest in the county, and also deserve illustration.

CHIPS.

The Wesleyan schools at Wolstanton, Staffs, are being enlarged from 330 to 450 school places. Messrs. Ford and Slater are the architects, and Mr. George Ford, of Wolstanton, is the builder; the outlay will be about £600.

At an extraordinary meeting of the local board of Towyn, North Wales, last week, Mr. F. J. Collingwood, of Rhyl, C.E., produced plans and specifications of the proposed sea wall, esplanade, carriage drive, and foot-road on the common close to the beach, which, after some discussion, were approved. The esplanade is to be 480 yards in length and 90ft. broad, and to be made of concrete; 30ft. of the side next to the sea will be asphalted. The footpaths are to be tiled, and the carriage drive, 30ft. wide, will be metalled with granite. There are slips to the beach at both ends and in the middle of the sea wall.

At the last meeting of the town council of Derby correspondence which had passed between the town clerk and Mr. James Mansergh, C.E., as to the charges of the latter for a report on the special drainage of the town was read. Mr. Mansergh's bill, based on the time spent on the report, amounted to £528 14s. 1d., but he has agreed to accept 150 guineas.

Another stage in the improvement of the parish church of Leamington is being reached by the addition of a choir vestry on the north end of north transept, now in progress. The chancel is also about to be reseated, rearranged, and decorated. Mr. John Thompson, of Peterborough, is the builder.

The new Wesleyan chapel and schools at Hatfield, Herts, illustrated in the BUILDING NEWS for March 8 last, were opened on Monday week. Mr. Elijah Hoole was the architect.

The Wesleyan Chapel in Stafford-street, Walsall, was reopened on Thursday week after partial rebuilding and enlargement by 120 additional sittings, effected at a cost of £900. Mr. H. E. Lavender, of Walsall, was the architect, and Messrs. Dorse and Son, of Brierley Hill, were the builders.

St. Andrew's church, Beesby, Lincolnshire, was reopened on Wednesday week after restoration, effected at a cost of £400. Mr. Kirk, of Sleaford, was the architect, and Mr. Kine, of Candlesby, the contractor.

* Illustrated in the BUILDING NEWS for June 14, 1889.

PITCH OF ROOFS.

MINIMUM STAIN REQUIRED TO PREVENT INCREASE OF SPAN.
LOAD 100. STRAIN 0·00.

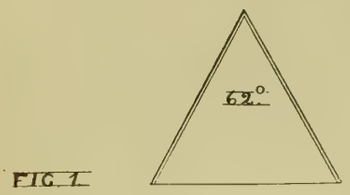


FIG. 1. 0·00

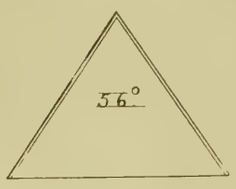


FIG. 2. 0·04

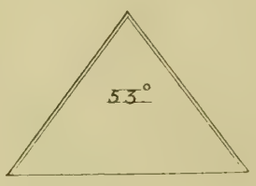


FIG. 3. 0·05

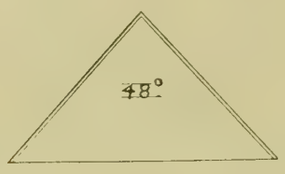


FIG. 4. 0·10

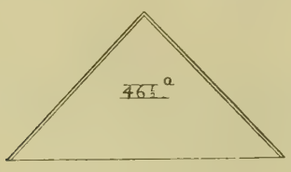


FIG. 5. 0·13

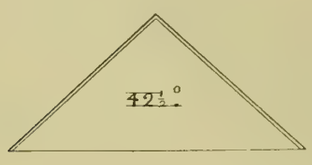


FIG. 6. 0·17

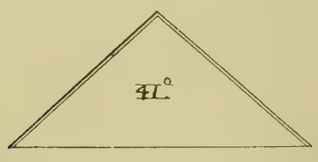


FIG. 7. 0·22

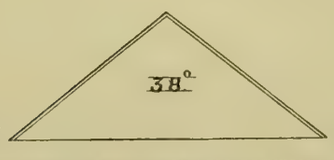


FIG. 8. 0·30

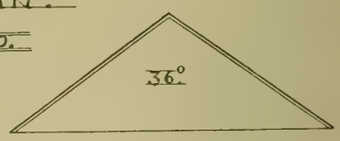


FIG. 9. 0·37



FIG. 10. 0·45

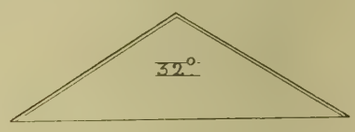


FIG. 11. 0·52

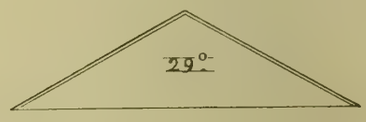


FIG. 12. 0·63



FIG. 13. 0·70

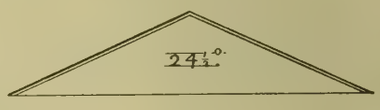


FIG. 14. 0·80



FIG. 15. 0·90

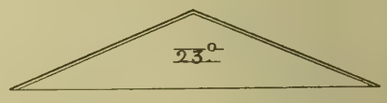


FIG. 16. 1·00



FIG. 17. 1·22

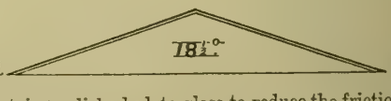


FIG. 18. 1·50

PITCH OF ROOFS AND STRAIN ON TIES.

IT may safely be assumed that some professional gentlemen and others engaged in building construction, have not always the formula at their finger-ends to calculate the strain on roof-ties, when the rafters are placed at the various angles as required in ordinary practice. The following particulars are the result of careful experiment, repeatedly checked to ascertain if any difference were perceptible. The experiments were conducted at the side of a street under heavy traffic, consequently the vibration was similar to that of a roof on any building adjoining a street.

The foot of "principal rafters" were dressed smooth, oiled, and placed on level bearings of polished plate glass to reduce the friction as much as possible. If accurately calculated, the angles and strains indicated on the accompanying drawing, and described in the following table are not uniform, but sufficient to enable anyone to arrive at a safe working section of tie and connections to principal rafters.

The load is calculated at 100, and the figures

on the right-hand side of each Fig. is the minimum strain required to resist increase of span. If the connections in tensile strain are made of ordinary wrought iron, the safe working section should be equal to five times the minimum strain. This margin of safety will be sufficient to overcome any defects in ordinary welding or irregularity in the iron.

If the tie and connections are made of mild steel, well forged, a safe working section to resist four times the minimum strain will be sufficient, that is, with mild steel resisting 28 tons per square inch, and not less than 20 per cent. of elongation at destructive test.

TABLE OF LOAD, ANGLE OF RAFTER AND STRAINS.

Number of figs.	Load on roof.	Angle of roof.	Minimum strain.	Maximum strain on tie of mild steel.	Maximum strain on tie of wrought-iron.
1	100	62°	0·00	0·05	0·06
2	100	56°	0·04	0·16	0·20
3	100	53°	0·05	0·20	0·25
4	100	48°	0·10	0·40	0·50
5	100	46½°	0·13	0·52	0·65
6	100	42½°	0·17	0·68	0·85
7	100	41°	0·22	0·88	1·10
8	100	38°	0·30	1·20	1·50
9	100	36°	0·37	1·48	1·85
10	100	33°	0·45	1·80	2·25
11	100	32°	0·52	2·08	2·60
12	100	29°	0·63	2·52	3·15
13	100	27°	0·70	2·80	3·50
14	100	24½°	0·80	3·20	4·00
15	100	24°	0·90	3·60	4·50
16	100	23°	1·00	4·00	5·00
17	100	20°	1·22	4·88	6·10
18	100	18½°	1·50	6·00	7·50

W. B.

LONDON DOCK AND WHARF TRUST.

At the weekly meeting of the Balloon Society, held at St. James's Hall, on Friday evening last, a lecture was delivered by Mr. W. H. Le Fevre, C.E., the president of the Society, on "A London Dock and Wharf Trust." Mr. Merritt occupied the chair. After a brief opening address by the chairman, the lecturer observed that the protracted strike of the dock labourers marked a new era in the struggle between capital and labour. The real origin of it was the insane cut-throat competition between the dock companies and the wharfingers, intensified by the keen contest between shipowners and merchants and the superabundant dock accommodation now in existence. One important aspect of the strike was the position of the shareholders in the dock companies, many of whom were widows and orphans of very limited means. There were about 1,500 shareholders in the East and West India Docks Company, and some 3,000 in the London and St. Katherine Dock Company, who were in the inevitable position of receiving no dividend, and exercising no control over their property. Attention had been called to the growing tendency of the trade of the Port of London to pass further and further down the river, in order to accommodate the ever-increasing draught and length of the immense vessels now becoming so common, and it was therefore clear that what London wanted was *deeper water*, that might be obtained by inaugurating a thorough system of dredging from London-bridge to Gravesend, similar to what had already taken place on the Tyne and the Clyde, aided by an embankment on both sides of the river, so as to cause the tide to ebb and flow quicker. With regard to what a harbour trust could do, the reply was that in some ports it had done *everything*, as was instanced in the case of the Tyne, the Clyde, and some other rivers. It was evident in existing circumstances that something must be done if England were to continue to be the depot of the world's commerce, with London for its centre. The control of the Thames Conservancy might be confined to the river above the bridges, and a London Dock and Wharf Trust might be formed for the Port of London, to which the London County Council should contribute one moiety for deepening the river Thames from London-bridge to the sea.

It was not an impossible thing to accomplish, to take the docks of London at what they cost, and consolidate them all into one trust. Until quite lately the dividends paid by the dock companies of London upon the total capital invested worked out at about the same rate per cent. per annum as the interest paid by the Mersey Docks and Harbour Boards on its total debt. The Corporation of London had dealt with everything from electricity to pleasure haunts, and why should they not take in hand our grand river and its shipping, and promote a Bill in Parliament with a view of raising a discussion on so important a matter as a dock and wharf trust, in order that the question might be brought to a satisfactory conclusion?

Mr. Martin Wood moved, "That the vast shipping interests of the Port of London urgently demand the establishment of a Dock and Wharf Trust, to be controlled by responsible commissioners duly elected."

This was seconded by Mr. White, F.S.A., and, after some discussion, was carried by a large majority; as was also a second resolution calling upon the City Corporation and the London County Council to promote a Bill in the next session of Parliament for the formation of a London Dock and Wharf Trust, similar to those in existence in the Clyde, Mersey, and Tyne.

NEW "DISC-KEY" SYSTEM OF LAYING WOOD BLOCK FLOORS.

A VERY simple and ingenious method of laying wood-block floors has been patented by the Westminster Patent Flooring Company, of 18x, Abingdon-street, Westminster. The improvement consists in the system of bonding adopted. The blocks of wood, which may be of any plain or ornamental hard wood, and of a size varying from 9in. by 3in. to any other proportionate dimensions, are grooved along the sides and two "disc-keys," of galvanised-iron or zinc, are placed in the corners of each block, thus bonding it to six other blocks and binding the whole floor together. These blocks are further fixed to a concrete foundation in the following manner: Dovetailed bonding blocks are fixed at intervals in the concrete, and nearly level with it, and into these blocks galvanised-iron screws are driven attached to disc-keys, which secure the blocks to the substructure. The disc-keys enter the grooves cut into the sides of the wood blocks, and thus do not show externally. The bonding-blocks are of a tough concrete to hold the screws, and cannot shrink or decay like wood, and are slightly dovetailed at the bottom to form a keyed fixing to the concrete. The wood blocks are laid in a strong mastic or waterproof composition, forming a damp-proof course over the surface of concrete, and forming an adhesive jointing between the blocks. To give them additional hold, the under edges have dovetailed grooves. The blocks we saw are made in a variety of sizes and thicknesses, and of deal, pitch-pine, oak, teak, American walnut, birch, beech, mahogany, jarrah, black butt, tuart, and other Colonial woods. Large thick blocks of yellow deal, arranged in herring-bone fashion, can be fixed on this principle for school, warehouse, and other floors; the thinner and smaller blocks varying in thickness from 1in. to 2in. We noticed examples of this patent flooring in various arrangements with borders, and it is evident that any design in which blocks are used can be laid on this system.

A special kind of wood floor is also made by the Westminster Flooring Co., with a kind of grooved and tongued joint, by which the nails are not seen, being driven slantwise through the solid tongue; and we also notice a thin, round, tongued oak-floor finishing, from ¼ to ⅜, for laying over old or rough deal floors when the house is dry. It is also secret-nailed with a flat, elliptical, steel floor-brad, and fixed with patent glue. The fixing by corner discs of metal, the imperishable substratum, and the thinness of the blocks that can be laid by this system are important considerations where sound and ornamental floors are required.

Memorial stones of a new Sailors' Home and Rest were laid on Thursday week at Fowey. The building is to be erected in Fore-street, the total cost to be about £1,200. It will be three stories in height, and provision has been made for six cabins, bagatelle room, library, class rooms, writing, reading, bath, and living rooms, and a mission room holding sixty persons. The building is being erected by Mr. Nathaniel Pentre, of Polruan, from designs prepared by Mr. W. J. Sambells, architect, Fowey.

The legislation of the last session included a Bill promoted by the City Corporation, its object being to alter the level of certain streets in order to improve the approaches to the Tower Bridge, and to extend the time for the completion of the works authorised by the original Act to August, 1893.

Building Intelligence.

EXETER.—The formal opening of the new Middle School, erected by the Govenors of the Exeter Episcopal Trust, took place on Tuesday. The school has hitherto been located in the old Bankruptcy Court, in Queen-street. The new school buildings on the Pennsylvania-road are from the designs of Mr. James Jerman, Exeter, and have been erected by Mr. William Gibson, also of that city. The style is Renaissance. The walls are of dark local brick—supplied by Messrs. Hancock—with Box stone dressings. The main entrance is of Box stone, the doorway being flanked by Doric columns, while in a panel above are the City Arms carved in stone. The frontage is divided into bays by Ionic columns. The ground floor is divided by a corridor extending the whole width of the building. On either side of entrance in front of building are two class or mistresses' rooms, and a room for the head mistress, each 24ft. by 20ft. On the opposite side of the corridor are cloak-rooms, offices, and a strong-room, while in a wing on the ground-floor are the Kindergarten, 30ft. by 18ft., and a cloak-room. On the first floor, approached by a broad stone staircase, is the chief school, having open-timbered roof. This room is 73ft. by 24ft., and at one end, shut off by revolving shutters, is a dining-room, 24ft. by 20ft. In the wing over the Kindergarten there is a class-room and sitting-rooms for teachers. The corridors are laid with encaustic tiles, manufactured by Messrs. Webb, of Worcester, and the floors of those on the upper story are of concrete, carried on iron cross girders. All the rooms are provided with fireplaces. The building will be heated throughout by hot-water pipes. The carved work was carried out by Mr. Harry Hems, of Exeter.

FARNWORTH, NEAR BOLTON.—New Salvation Army citadel buildings are about to be erected for General Booth in Albert-road. The citadel will be of brick, and approached from Albert-road by short flights of steps, leading to four spacious entrances, two of which again lead to a large, deep gallery, octagonal in form, extending across the front and round two-thirds of the sides of the building. The gallery intersects two tiers of boxes, each side capable of accommodating 25 persons, and these in turn are connected with the speakers' and soldiers' amphitheatre stage, the latter being formed in a recess behind a proscenium wall. Separate side entrances and staircases are provided for the boxes. The other front entrances lead to a commodious foyer, communicating with auditorium and left and right wing seats. In the side walls two extra exits will be provided, which are to be opened only from the inside in case of panic. There are offices, guard-rooms, a heating chamber, and the usual appurtenances at the sides and behind the amphitheatre recess. For the week night meetings the citadel will be so arranged that a comfortable fortress can be easily formed capable of seating 400 persons, and the full accommodation will be 1,200. Outside, the elevation to Albert-road is to be of a bold castellated character, finished with turrets and battlements, and the entire structure will be well lighted, heated, and ventilated. The conception of the general arrangements is formed on a fundamental basis of many years' practical experience of the Army, and partaking as it does more of the character of a theatre than ordinary places of worship, will be considered by many people as an interesting innovation of a very novel character. Farnworth has been selected by General Booth as the first place to give this plan practical effect, and it is likely to inaugurate a new forward policy in matters appertaining to Salvation Army mission hall buildings. The work is being carried out by local builders (Messrs. Taylor Bros., of Albert-road), who have obtained the contract in open competition, under the superintendence of the Army architect, Mr. J. Williams Dunford, of 101, Queen Victoria-street, London, E.C., whose resident clerk of works is Mr. Streeton. The total cost of the erection will be over £2,000.

WOLVERHAMPTON. — On Monday last the memorial stone was laid for new mission hall and class-rooms connected with St. Luke's Church, Wolverhampton. The buildings consist of a hall 47ft. by 23ft. 6in., two class-rooms, each 14ft. by 12ft. 3in., and cellar, with sink, &c. The materials used are local bricks, with Penkridge stone heads and mullions, &c., to openings. The roof is covered with slates, and there is a bell

turret on ridge. There is efficient inlet and outlet ventilation provided, and this and all the work is being carried out by Messrs. Bradney and Co., builders, from plans by and under the superintendence of Mr. Joseph Lavender, A.R.I.B.A., of Wolverhampton.

SCHOOLS OF ART.

BIRMINGHAM MUNICIPAL SCHOOL OF ART.—A special sub-committee of the Museum and School of Art Committee of the Birmingham City Council met on Friday to award the "blue ribbon" of the school—namely, the scholarship founded in memory of the late John Skirrow Wright by Messrs. Richard and George Tangye for exceptional merit. The scholarship is of the total monetary value of £180, payable in quarterly instalments extending over three years, and also includes free admission to all the classes at the Central School. The award is made on three classes of examinations, and thirteen of the most advanced students of the school fulfilled all the conditions for the first award. Mr. W. J. Wainwright, A.R.W.S., the examiner, recommended the award of the scholarship to Mr. Fred. Mason, who obtained the highest number of marks in each of the three sections of examination; and that the following three students, named in order of merit, should be honourably mentioned: Mr. Charles M. Gere, Miss Gertrude M. Bradley, and Miss Edith E. Biddle. The sub-committee awarded the scholarship accordingly.

CHIPS.

Damage to the extent of £4,000 was done by fire on Thursday in last week at Messrs. Chadwick and Sons' cabinet works, Blackburn. A building 80ft. long and two stories high was burnt out.

The death is announced at the early age of 41 years of Mr. Araunah O. Robins, clerk of the works for the Buckland, Brewer, and Barnstaple districts of the Rolle Estates, and chairman of the school board of the first-named parish. To his energy and tact the success of the recent development of the Rolle Estate at Barnstaple has been largely due.

The new Roman Catholic Church of All Saints, Oakfield, Anfield, Liverpool, was opened on the 5th inst. by Bishop O'Reilly. The building is seated for 450 persons, and has cost altogether upwards of £5,000. The architects were Messrs. J. and B. Sinnett, of Harrington-street, Liverpool, and the contractor Mr. T. Urmston, of Soho-street, in the same city.

Mr. Joseph Burt, borough surveyor at Lostwithiel, and newly elected vice-chairman of the School Board, died very suddenly on Sunday. Mr. Burt was fifty years of age, and was highly respected in the town.

A new Wesleyan Chapel at Bilton, near Harrogate, was opened on Friday. It is Gothic in style, built of Killinghall stone, and has cost £1,100. Mr. T. Butler Wilson, of Harrogate, was the architect.

The designs sent in for the proposed national memorial to be erected at Berlin to the late Emperor William number 144, 47 of which are accompanied by large models. The jury of awards will meet on the 30th inst.

The foundation stone of a new church for Tredegar, to be dedicated to St. James, was laid on Thursday afternoon, the 5th inst. The church is intended to accommodate 500 persons, is of local stone, and is designed in the Early English style. The contract for the building is being carried out by Mr. Edward Morgan, of Tredegar. The estimated cost when the edifice has been completely furnished is about £2,500. The architects are Messrs. James and Morgan, Charles-street-chambers, Cardiff.

At a vestry meeting held at Doddeshill, a suburb of Droitwich, on Friday, formal sanction was given to the restoration of the parish church. The work will include the lowering of the floor level, the same to be covered with encaustic tiles and wood blocks, the roof of the chancel and tower to be opened out and boarded, benches and choir-stalls to take the place of the pews, gas was also to be laid on, and a new heating apparatus put in. The organ will be repaired, at a cost of nearly £200, by Messrs. Nicholson, of Worcester. Mr. Lewis Sheppard, of Worcester, is the architect, and the contract has been intrusted to Mr. Jonathan Brazier, of Bromsgrove. The cost of the restoration will be over £1,000, the whole of which Mr. John Corbett, M.P., will defray.

Great preparations are being made at Dewsbury for the formal opening of the new Town Hall, a ceremony fixed to take place on Tuesday next. Messrs. Holtoo and Fox, of Dewsbury, are the architects, and Messrs. Chadwick and Son, of Staincliffe, are the chief contractors for the building.

Engineering Notes.

THE RIBBLE WORKS, PRESTON.—On Saturday and Monday, Rear-Admiral Sir George S. Nares, Sir C. Augustus Hartley, and Mr. J. Wolfe Barry, the commissioners appointed by the Board of Trade to inquire into the feasibility of the Preston Corporation scheme for improving the navigation of the Ribble, and to report thereon, made inspections of the channel of the river from Preston to the sea. The commissioners were accompanied by Mr. Sykes, C.E., the Ribble engineer; Mr. Hamer, town clerk, representing the Preston Corporation; Mr. G. N. Abernethy, C.E., and Mr. G. H. Dickson, on behalf of the opposing "Party of Caution"; and Mr. L. F. Vernon Harcourt, C.E., on behalf of the Corporation ofSouthport. By the terms of their appointment the commissioners will inquire into the whole plan for providing a way from Preston to the sea, as to the dredging, the training walls, the dock and its equipments, and as to what should be done under present circumstances. They will also report to the Board of Trade as to what authority should have control of the works in future. The opponents of the scheme object to the management remaining in the hands of the Corporation, believing that it would be more efficiently conducted by a harbour board. The commissioners will report upon the project on the 30th instant.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

GLASGOW ARCHITECTS AND THE ROYAL SCOTTISH ACADEMY CHARTER.—A meeting of architects was held in the Religious Institution Rooms, Glasgow, on the 5th inst. Mr. J. Gordon, president of the Institute of Architects, in the chair. The chairman explained that the meeting had been called for the purpose of considering what action, if any, should be taken in view of the application of the Royal Scottish Academy for an amended charter. The body was founded in 1838, ostensibly for the advancement of painting, sculpture, architecture, and engraving. How far it has served its purpose in regard to painting was a question for painters to determine. In respect, however, of architecture, he thought they were pretty well agreed that its action in the way of advancing architecture had been nil. After fully fifty years' existence, the Royal Scottish Academy was now applying for an amended charter, with additional privileges. It was thought, therefore, that the time was suitable for endeavouring to secure a fuller recognition of the claims of architecture by that body, and a better representation of architects in its membership. How these were to be secured was a question they had not met to determine. The architects of Edinburgh were moving in that direction, and he believed they had appointed a committee. The present meeting had been called to consider whether a committee of the Glasgow architects should be appointed to associate with their friends in Edinburgh. After a discussion it was agreed to adopt the suggestion of the chairman, and a committee was appointed to co-operate with Edinburgh architects.

A public abattoir is on the eve of completion at Shipley, near Bradford. The building has cost £2,000, and is situated in Ashley-lane, abutting on the railway and canal. A main sewer passing under the land affords efficient drainage facilities. The premises comprise a killing and hanging shed, partially partitioned, 65ft. by 50ft.; three roofed sheep pens, 21ft. by 10ft., a fasting shed, a hide-room, a mistal, with a second story for fodder, a boiler-house, and a yard. The building is of ashlar dressed stone, lined with glazed brick, the floors are of concrete, and the roof supports are of wrought iron.

At the last meeting of the town council of Cardiff, it was stated that the borough engineer was an applicant for the similar position at Leicester, rendered vacant by Mr. Gordon's appointment under the London County Council, with a salary of £700 to commence with, and an increase of £60 a year up to £1,000. A committee was appointed to confer with the engineer with the view of arranging for him to withdraw from his application for the appointment at Leicester on the Cardiff Corporation offering him similar terms. It is not to be wondered at that for every vacancy there are a large number of candidates, as the applicant can often by the proposal to migrate secure equally favourable terms from his present municipal authority.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—J. B. P.—R. A. B.—T. L. B.

REX. (Professor Unwin's formula for the total breaking weight of columns of angle, channel, or cruciform sections, is—

$$W = \frac{19a}{1 + \frac{r^2}{900}}$$

where W = breaking weight in tons, a = sectional area in inches, r = ratio of length to diameter, the least diameter being used. We refer "Rex" to Dr. Stoney's "Theory of Stresses."—"ANXIOUS SCOTSMAN." (We can hardly advise you from the samples sent of the fungus and wood. Preventive means are alone satisfactory in cases of dry-rot, such as steeping the timber in corrosive sublimate, injecting creosote under pressure, as in Bethell's process. We can only recommend you to remove every trace of the fungus from the timber and walls by scraping or cutting it away; the surface of soil under floor should be removed, so that no spores should be left, these diseased parts being burnt. If the timber is much decayed or attacked, it should be cut or burnt out, and replaced by new. Saturate the beams with corrosive sublimate, carbolic acid, or a strong solution of copper sulphate in boiling water. The air under floor should be disinfected by burning sulphur.)

Correspondence.

ST. ALBAN'S AND MR. HEMS.

To the Editor of the BUILDING NEWS.

SIR,—Mr. Harry Hems, in his indignation, forgot to say that my letter to him was in answer to an impudent one of his own, in which he announced three remarkable discoveries: that I am "Ars," that I live near Cork, and am a barrister—not that there is anything to be ashamed of were all three true; but he forgets that a fortnight ago he was equally sure that "Ars" was a naturally jealous tradesman, was engaged in some discreditable job at St. Alban's frustrated by Mr. Hems's virtuous son, and that he knew all about Mr. Hems's movements. Probably in another fortnight he will evolve yet another "Ars." He also says he believes I have no intimate personal acquaintance with St Alban's. Now it appears in all the letters by "Ars" that he not only knows St. Alban's by heart, but also numbers of other works at hom

and abroad too. "Ars" may be content to have his statements taken (in Mr. Hems' language) "for what they are worth," which happens to be so much that not one of them has been effectually met, and that he has got the better of every architect who attacked him—from Mr. Scott to Mr. Gough, who has now transferred his Ananias-like pen to the *Guardian*—safe ground, seeing that Lord G. is not loved of some of the clergy, and that it enables Mr. Gough to advertise himself. His name was even unknown to me a few months ago; but he coolly wrote to me the other day, hoping, no doubt, that I should assist his desire for notoriety. Mr. Hems may be glad to know that, to acquire the intimate knowledge of St. Alban's in which he says I am deficient, I am going there in a few days, and shall carefully scan the old and new work, including his statuary—which does *not* look inviting on paper—though that is a matter for his generous employer, Mr. H. H. Gibbs. I hope I shall also find (though not for Mr. Hems's sake) that the rumour I mentioned to him *is* untrue.—I am, &c., W. H. M. Ellis.

University Club, Dublin, Sept. 7.

Sir,—Readers of the Building News now know that the actual writer of the letters signed "Ars," is a W. H. M. Ellis, barrister, of Monkstown, Dublin; but no one for one moment, I suppose, suspects him of being their author?

I am glad, however, that the shameful attack he made upon my son's (Greville C. Hems) character in your issue of 13th July, at a time when he *knew* I was away in Morocco—an attack he practically repeated in the Building News for the 30th ultimo—has brought to hand quite a bundle of indignant letters from all sorts and conditions of men; every one of whom refer to my son in the highest terms. Amongst them is one from the Ven. Archdeacon of St. Albans, who, on the 5th inst., writes:—

"Your son has had a very trying position to occupy at the Abbey, and has always behaved himself exceedingly well in it. I have a high opinion of him, and have never heard anything but good of him."

The Rev. W. D. W. Dudley, M.A., the vicar of St. Stephen's parish, St. Alban's—and of whose choir my son has long been a member; writes under the same date—and in warm terms speaks of the regret he feels at his leaving St. Alban's, and of the high estimation he is held in generally. "As for his anonymous detractor," he adds, "he is utterly beneath contempt!"

Personally, I have not the least intention of entering into a discussion with "Ars" (Ellis); but as he affects to be anxious to know where "trade feeling and jealousy" has stepped into his letters, I remind him that if I had not carried out the renovation of the high altar screen under the direction of Sir Arthur W. Blomfield, A.R.A., some one else, probably, would have done so. And, as "Ars" (Ellis) is wholly dependent on somebody else for what he writes, it is not hard to guess where the "trade feeling and jealousy" that prompts the spleen his writings contain, has come from.

Further, "the mean and ungentlemanly action" I referred to—that my son, in part, frustrated—and which "Ars" (Ellis) would have us believe he knows nothing about—occurred in my people's absence from the abbey during the dinner-hour on Thursday, the 14th of March, 1889. Soon after 1 p.m., a person, who I am told is named Cabron, accompanied by another who looked like a little pettifogging lawyer—"Ars" (Ellis) may possibly recognise him from this—in defiance of the protest of the verger, scaled my hoardings by which the screen was surrounded, ascended the scaffolding erected against it, and were only stopped from doing possible mischief by the timely—though to them very unexpected—arrival of my son.

When "Ars" (Ellis) was in Lincolnshire with the county Architectural Society recently, he said he would give £50 to a church restoration for every thing that could be refuted in "Ars'" (Ellis) letters to the Building News.

Now, in his letter in July 12th's issue, he refers to "my friend Mr. Chester, a great authority on *scarabæi* and the unspeakable Turk"; but the gentleman in question, writing me under date of the 6th inst. from Leamington, says: "I do not know him, and am much disgusted at the impudence of the man in mentioning me." Certainly, after this terse and emphatic denial of "Ars'" (Ellis) statement, that the Rev. Greville J. Chester, M.A., is his friend, I claim the first £50 for my own parish church of St. Sidwell's, Exeter. And it cannot be doubted that many another £50 will have to be forthcoming if "Ars" (Ellis) is anything like as good as his word.—I am, &c.,

Exeter, Sept. 10. Harry Hems.

THE APOLOGISTS OF THE WOULD-BE-THOUGHT ARCHITECT.

Sir,—"Ars," like the "Vicar," is so utterly ignorant of architectural matters, that but for the sake of others it would not be worth while to notice his statements. It is certainly useless to try to correct his ideas and to make him understand things.

As regards the tacked-on ornaments of the Beverley screen, it is not at all likely that Sir Gilbert Scott intended the work to be executed so, and the blame must lie with the clerk of works for passing such work. But whether or no, "two blacks won't make a white"—the St. Alban's work is wrong.

With respect to the so-called sham windows at Beverley and Worcester, as they are not particularly named, it is impossible to identify them; but I feel justified in asserting that they do not resemble the foolish performance at St. Alban's, nor are the tower windows at Doncaster of the same kind. I know well the old buildings of this country, and have seen many in France, Germany, Austria, and Italy, but never met with such absurdity in old work. If any such exists approximately it would not be by original intention, but subsequent change. So, possibly, in modern examples. The offensiveness of the St. Alban's window is not that it lights two stories merely, but that the heads seen inside below are a constructive falsification of the exterior design. The merest tyro in an architect's office would not commit such a base, contemptible, and wholly ridiculous infraction of rule.—I am, &c., M.

Intercommunication.

QUESTIONS.

[10084.]—**Heating Glasshouse.**—Will any kind friend please inform me how to heat a small glasshouse containing about 100 cubic feet?—Young Horticultural Architect.

[10085.]—**Price of Stonework.**—Will any of your readers kindly tell me what is about the average price that the stonework is actually taken at per cube yard in London street fronts, such as large offices and mansions—as, for instance, the new building at the corner of Parliament-street, Westminster—also of the ornamental brick fronts now so frequently put up?—E. B.

[10088.]—**Liability of One Trade to Make Good Damage to Another, where Work is Carried out Conjointly.**—Can an architect, for the purpose of recouping gasfitter, legally deduct from balance due to plasterer damage done by the latter's men to lead gas-piping, caused by nails driven in firing wood screeds, required in running plaster cornices?—Fairation.

[10087.]—**Galvanised Iron Studio.**—Will any of your readers recommend me the most simple and economical way of heating a galvanised iron studio, situated away from the house? Measurements: 26ft. long (inside), 20ft. wide, 12ft. high. It is lined with felt and matchboarding.—Studio.

[10088.]—**Cold Storage Room.**—I have to build a cold room for meat and game over a room now used for salting meat, &c. Will the salt cause an extra waste of the ice packed in cold room?—if so, what is the remedy, and how long would block-ice keep in the above room if made air-tight?—Cold Room.

REPLIES.

[10079.]—**Assistant Surveyors, R.E.**—The limits of age for this exam. are 21—30. The exams. are held in London at irregular intervals—generally in spring—and the number of vacancies varies, the average being five or six at a time. Only men of strong constitution should enter, as the medical test is severe. I was rejected myself in 1883 on this score, after passing exam.—G. A. T. Middleton.

[10075.]—**Plaster House, Audley End.**—I have just returned from a bicycle tour through Herefordshire and Cambridgeshire, and have now noticed your remarks about a plaster house at Audley End. I sketched an old house there close to the railway, but I fear it is not the one you refer to. However, I will send my sketch-book to Editor if desired so to do by him, as I made several sketches of old work in that district, and which could be published as you suggest. I am sure it would interest other lovers of old work besides you and myself.—John A. Gill Knight.

[We should be glad to see the kindly-proffered sketches.—Ed. "B.N."]

[10039.]—**The Right of Way, &c.**—Though I am willing to give information, I cannot undertake to furnish brains. "Ars'" statement is incomprehensible. I said at first the chamber was an ossuarium, and I say so still. My opinion may not be thought worth much, but antiquarians will no doubt respect the judgment of Mr. Parker. He spent many years in antiquarian pursuits, and, in my opinion, his authority is incontrovertible.—M.

[10044.]—**Churches with Skewed Chancels.**—I hold to the opinion I at first expressed, though I admit there may be exceptions from common-sense causes we are ignorant of.—M.

[10079.]—**Assistant Surveyors, R.E.**—A candidate for this exam. may be any age between 21 and 30. The examinations are not held at fixed intervals, but only as vacancies occur, and average one about every 18 months. They are held in London, Edinburgh, and Dublin—whichever is the nearest place for the candidate. I will be pleased to tell "F. C. L." more about this subject if he will communicate with me by advertising his address in your columns.—J. W. T.

WATER SUPPLY AND SANITARY MATTERS.

Clerkenwell.—At the request of the London County Council, Dr. Griffith, medical officer of health for Clerkenwell, and Mr. William Iron, the parish surveyor, have prepared detailed reports as to the insanitary areas existing in the parish. Concerning most of them they had long since presented reports to the local vestry, pointing out the improvements needed to render fit for human habitation the insanitary and overcrowded dwellings which admitted of improvement at all; but in the majority of cases they state that total demolition would alone suffice to remove the unhealthy conditions under which a large industrial population existed, and this the parish, out of its local rates, was too poor to effect. Dr. Griffith now specifies 14 different places which, in his opinion, are insanitary, and should be done away with.

Stockton and Middlesbrough Waterworks.—The ceremony of cutting the first sod of the Blackton reservoir in connection with the waterworks of Stockton and Middlesbrough took place on Monday. The works, which belong to the corporations of the towns stated, and to the local board for South Stockton, were established in 1851, at which time the total population of the district was less than 20,000. The source of supply is at Broken Scar, a point on the river Tees about three miles south of Darlington. Having purchased the undertaking for £800,000 in 1878, the joint board appointed by the corporations at once set to work to obtain a better supply of water by going into the higher part of the river, and eventually they decided to construct an immense reservoir at Hury, the contract being let about four years ago to Messrs. Scott and Co. for £112,000. This reservoir will be complete in about two years, when the board will be enabled to pump an additional 15 million gallons per week, making in all 81 million gallons. The total cost of the undertaking to the end of February last has been £1,271,029. The weekly consumption of water now amounts to about 67 million gallons. The increasing demands for water have compelled the board to further extend their works by the construction of a large reservoir at Blackton, and on Monday the cutting of the first sod of this reservoir took place. Mr. James Mansergh, C.E., of Westminster, is the engineer, Mr. Hugh Bell being the chief assistant. Messrs. Scott are the contractors. The Blackton reservoir is the upper of the two large reservoirs which the board are authorised to construct in the Balder Valley. The embankment is to be placed at the western extremity of the Hury reservoir, and when completed the reservoir will have a depth of 61ft., a water area of about 75 acres, at its widest part a width of 750ft., a length of one mile, and a content of 460,000,000 gallons. The top water will be 925ft. above Ordnance datum, and 65ft. above the top water of the Hury reservoir.

At the close of last week the members of the Westmoreland and Cumberland Antiquarian and Archæological Society visited the Lake district. The party, which numbered about a hundred, were under the leadership of the president of the society, Chancellor Ferguson, F.S.A. The first place seen was Hawkshead, in North Lancashire, where Poet Wordsworth received his early education. Hawkshead Hall, a 13th-century building, was visited, and a paper read on its history by Mr. Swainson Cooper, F.S.A.; while Mr. John Ford, of Enfield, Middlesex, showed the Rawlinson monuments in Hawkshead Church. At the meeting at Ambleside in the evening, the president described the Roman camp above Ambleside, which covered 3½ acres. On the second day the party visited Langdale, and went over the rugged pass of Hardknott and Wrynose. At Little Langdale Mr. Swainson Cooper read a paper on the "Law Twig," and at the Roman camp at Hardknott Dr. Ferguson read a paper. A visit to Eskdale Church closed the proceedings.

On Sunday week, four new stained windows were unveiled at St. Peter's Church, Newlyn, near Penzance. The subjects are Dorcas and the three virtues, Faith, Hope, and Charity.

The local board of Consett, Co. Durham, have adopted a sewerage scheme for the district, prepared by Mr. R. Robinson, C.E., of Darlington.

Our Office Table.

WE have frequently had to expose the scurvy manner in which local authorities treat architects, and the curious notions men sufficiently well known to be elected on public bodies entertain of the functions, duties, and positions of members of the architectural profession. A new instance has just come to light at Ramsey, Isle of Man. The town commissioners of that small watering place employed Mr. J. A. Berrington, a Liverpool architect, to prepare plans and superintend the erection of new public offices, offering a percentage of 2½ only on the cost—some £1,400—which was accepted. The works having been completed, Mr. Berrington sent in a charge at the rate agreed on, together with travelling expenses; but they replied repudiating liability for anything beyond the £34 10s. 6d. for commission. Mr. Berrington wrote back pointing out that after providing a clerk of works, paying £15 out of pocket for travelling expenses, and sundries for postage, telegrams, stationery, and stretchers, he would be left with a net remuneration of between £5 and £6 for all the time spent, and labour, worry, and annoyance he had gone through. At their last meeting the commissioners discussed the letter at length, several declaring that he had been sufficiently well paid already, and that his claim for expenses ought to be rejected, but it was agreed to acknowledge the letter, and to inform Mr. Berrington that the board was waiting for an answer as to a claim against the contractors. At the same meeting a letter was read from Mr. T. J. Lilley, C.E., of London, the engineer for the Ramsey Bridge, protesting against the delay caused in forwarding a cheque for £250 on account, pointing out that it is customary for the engineer to receive payment on account at a much earlier stage than in this case, and asking for a proper agreement under seal. The commissioners decided not to pay anything or to take any action until Mr. Lilley has furnished a full account.

THE correspondence in the *Times* on "The Smells of London" has been continued throughout this week. Mr. H. Roumieu Gough wrote on Friday, pointing out that at present, while plans of all buildings have to be submitted to the surveyor of every local authority for approval, anyone, however ignorant he may be of sanitary science and of construction, may call himself architect, surveyor, engineer, or all these if he be so disposed, and many local authorities appoint as surveyors utterly incompetent men. The desirability of registration for architects is becoming more widely felt, and Mr. Gough epitomises the provisions of the Bill brought into the House of Commons last session by Mr. Wilson Noble, and which, he adds, will be again brought forward when Parliament reassembles. Dr. C. H. Allfrey, D.P.H.Cantab., wrote in Monday's issue, indorsing, from the medical health officer's view-point, Mr. Gough's advocacy of the Bill.

"THE SHARQI ARCHITECTURE OF JAUNPUR" is the subject of a monograph forming the chief portion of the first volume of the new series of Government Reports, begun since the reorganisation in 1885 of the Archæological Surveys in Upper India. The bulk of the letterpress in the report is by Dr. Führer, of the Survey and Curator of the Lucknow Museum, while the architectural descriptions have been written by Mr. Edward W. Smith, of Lucknow, the architectural surveyor to the Survey for the North-Western Provinces. Mr. Smith was formerly a student of the Royal Academy at Burlington House, and during some years was successively in the offices of Mr. Cutton, Mr. T. E. Collcutt, and Mr. John Slater. He joined the Survey Staff in 1886. Besides the monograph on the "Sharqi Architecture of Jaunpur," the report, which is published in this country by Messrs. Trübner, of Ludgate-hill, E.C., contains notes on the archæological remains at Zafarabad, Bhuila Tal, Ayodhya, and Sahet-Mahet. The plates have been reproduced by photo-lithographic processes at the Survey of India Office in Calcutta, and in themselves form an important contribution to Indian monumental archæology; whilst, apart from all description or comment, they will be found of much interest by the architect, the artist, and the historian of Indian architecture.

MR. M. J. DICKINS, Market-square, Bromley, Kent, has patented an invention, which consists in placing wedge-shaped or round courses of stone, brick, terracotta, wood, rubber, or other material (softer than the material of which the body of the road is composed) at regular intervals; such courses to be either at an angle of 90 degrees or less, to the direction of the road, according to the gradient of the same. These courses to be bedded on concrete and surrounded with asphalte, cement, or other paving, as preferred, harder than the intermittent courses. The upper surface of the common paving will wear slightly rounded, leaving the softer courses slightly lower than the general line of surface; the corrugation, it is claimed, will then give the necessary foothold and form depressions for conducting the surface water to the channels at the side of the road.

AN exhibition of works of art, illustrative of and connected with sport, will be held in the Grosvenor Gallery during the winter months of 1889-1890, and will comprise pictures by well-known masters of hawking, hunting, shooting, fishing, coursing, &c.; scarce prints, gold and silver plate, arms, implements, trophies, and reliques of artistic value and historic interest. The Duke of Edinburgh has accepted the chairmanship of the executive committee, and Mr. Archibald Stuart-Wortley has consented to act as vice-chairman, while the following gentlemen form the committee itself:—The Marquis of Granby, Mr. William Agnew, Lord Walsingham, Mr. J. E. Harting, Sir E. J. Boehm, R.A., Mr. Walter Gilbey, General Ellis, Mr. John Pettie, R.A., Captain E. Shelley, Mr. F. G. Prange, the manager of the gallery, and Mr. Hy. Bishop, secretary to the executive committee.

Architectural Association, 9, Conduit-street, W.—The Sixth Vacation Visit will take place on Saturday, Sept. 21st, to Maple Durham and Hardwick Houses. Names, with postal order for 5s., to be sent to Mr. Ernest S. Gale, 5, York-buildings, Adelphi, not later than Wednesday, Sept. 18th. Meet at Paddington 12.45.

FREDERIC R. FARROW } Hon. Secs.
ERNEST S. GALE }

CHIPS.

The tender of Messrs. W. and E. Wallis, of Gravesend, of £5,570 has been accepted by the Dartford School Board (subject to the approval of the Education Department) for the erection of new schools, caretaker's house, &c., at West Hill, Dartford, Kent. The architects are Messrs. Pincher and Long, of West Bromwich, whose design was selected in competition.

The adjudications in bankruptcy announced in Tuesday's *Gazette* include the name of James Connill Bulmer, of South Bank, surveyor.

A new boys' school is about to be built in connection with the schools at St. Simon's, Bristol, for the Rev. N. Y. Birkmyre. Mr. E. Henry Edwards is the architect.

The death is announced from Dieppe of the widow of the late Sir Horace Jones, the City Architect. Lady Jones, who died suddenly on the 5th inst., was fifty years of age.

Llandaff Cathedral was reopened on Sunday in its full extent after restoration. As soon as the Church Congress is over the south-west (or spire) tower will be taken in hand, and the foundations of its principal pier relaid in a more solid and substantial material than the present. This will involve a considerable outlay, for which the dean and chapter have appealed to the local public.

The construction of tramways is not making rapid progress in France, for, according to the report just published by the Minister of Public Works, the length open was only increased during 1888 from 450 to 455 English miles. The total cost of laying down the lines has averaged £12,000 per mile, and the returns of interest on capital invested averaged 4·71 per cent.

The People's Hall, 272, Whitechapel-road, is being converted into a food and shelter depot for General Booth. The work has been let to Mr. A. Martin, builder, of 92, High-street, Battersea. Mr. J. Williams Dunford, of 101, Queen Victoria-street, London, E.C., is the architect.

The new offices, Clare-street, Bristol, for the Provident Life Office, are fast approaching completion. The building consists of basement, ground-floor, first and second floors, and caretaker's apartments above. Mr. E. Henry Edwards, of 5, Clare-street, Bristol is the architect.

A new church school for St. Matthew's parish, Rugby, was opened on Monday week. It has been built at a cost of £1,000 from plans by Messrs. Wood and Hall, of Rugby and Birmingham.

Trade News.

WAGES MOVEMENTS.

KILMARNOCK JOINERS' STRIKE.—This strike terminated on Tuesday, the men returning to work at the old wage, 6½d. per hour.

EDINBURGH.—On Friday all the plasterers' labourers on strike in Edinburgh, with the exception of twenty men, returned to work, the advance of ½d. per hour (from 5d. to 5½d.) having been conceded by their employers. The twenty men alluded to were in the employment of one master, who did not grant the increase.

FALKIRK.—Some time ago the joiners and carpenters of Falkirk district requested an advance of wages from 6½d. to 7d., the rate in Glasgow being at present 8d. per hour. A majority of the masters agreed to the men's demands, but three or four refused. The workmen to whom the advance has not been granted came out on strike on Monday. The plumbers of Falkirk have asked for an advance of ½d. per hour, their present rate of 7d. being ½d. below that of Glasgow.

FORFAR.—The slaters here have had their wages advanced 1d. per hour, the rate now being 7d. per hour.

ARBROATH SLATERS.—The employers have agreed to an increase of a farthing per hour, and a further increase should the state of trade justify it.

The Gaiety Theatre is being entirely redecorated and re-upholstered by Messrs. Campbell, Smith, and Co., under the superintendence of Messrs. W. H. Romaine-Walker and Tanner, architects.

A new open space, to be known as the Mooragh Park, has just been completed at Ramsey, Isle of Man, for the town commissioners. Mr. McCulloch was the chief contractor, and the cost of laying out has been about £5,500.

The governors of the Bank of Ireland evidently do not believe that their head establishment on College-green, the widely known old Parliament House, will speedily revert to its old use. They have just accepted designs by Messrs. Millar and Sons, of Dublin, for new railings to replace the present rusty ones. These will be set on bases of stone from Ballyknocken Quarries Company, Dublin. Messrs. Kennan and Sons are the contractors.

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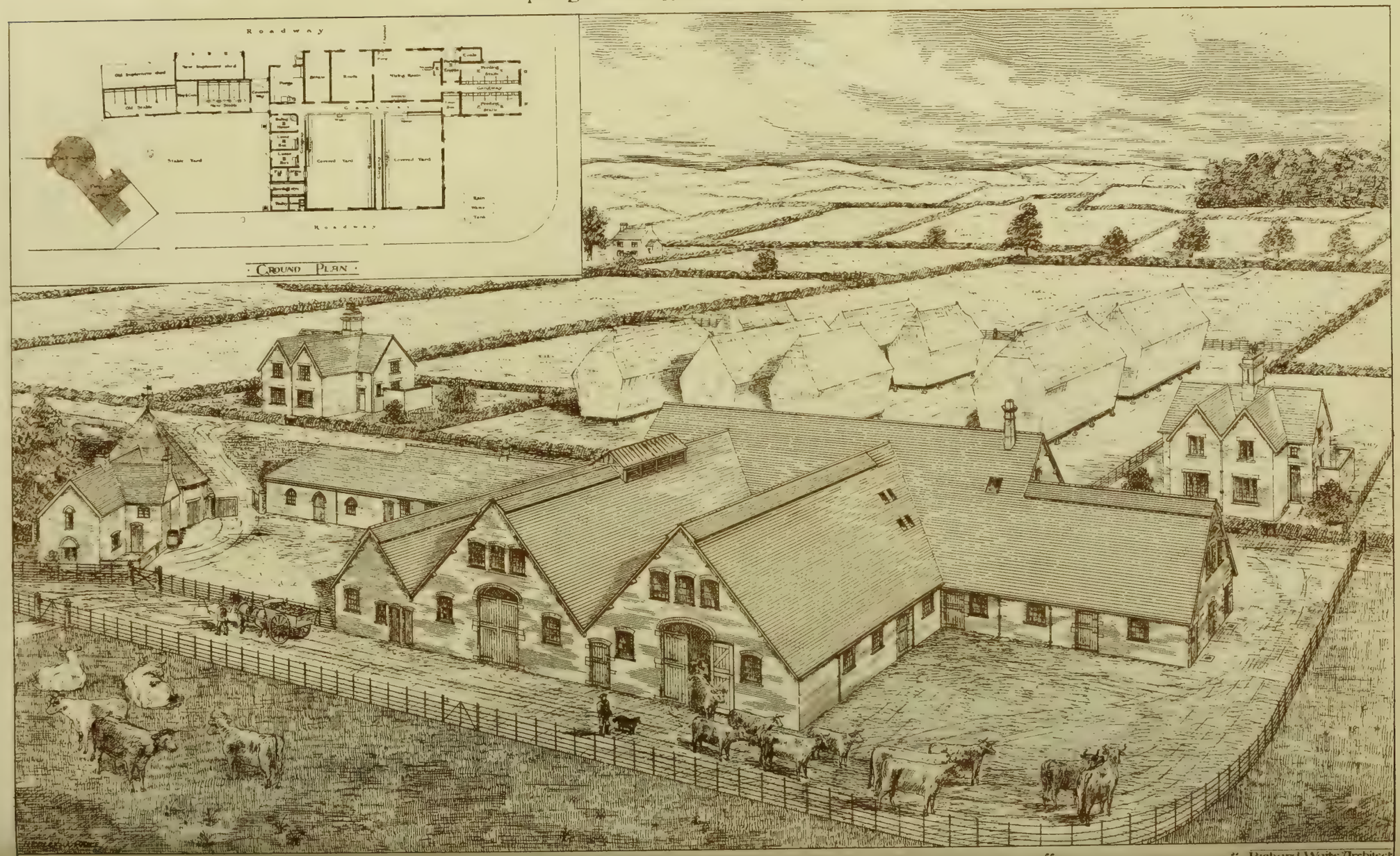


CHATEAU·DE·BLOIS·DETAIL·OI



IN·LOUIS·XII - DORMER· FRANCIS I

"Photo-Tint," by James Akerman 6, Queen Square, London W.C.



D[illegible] TORQUAY SEWAGE FARM.- S.E. VIEW OF NEW HOMESTEAD "ROUND HOUSE" Richard Waite, Architect

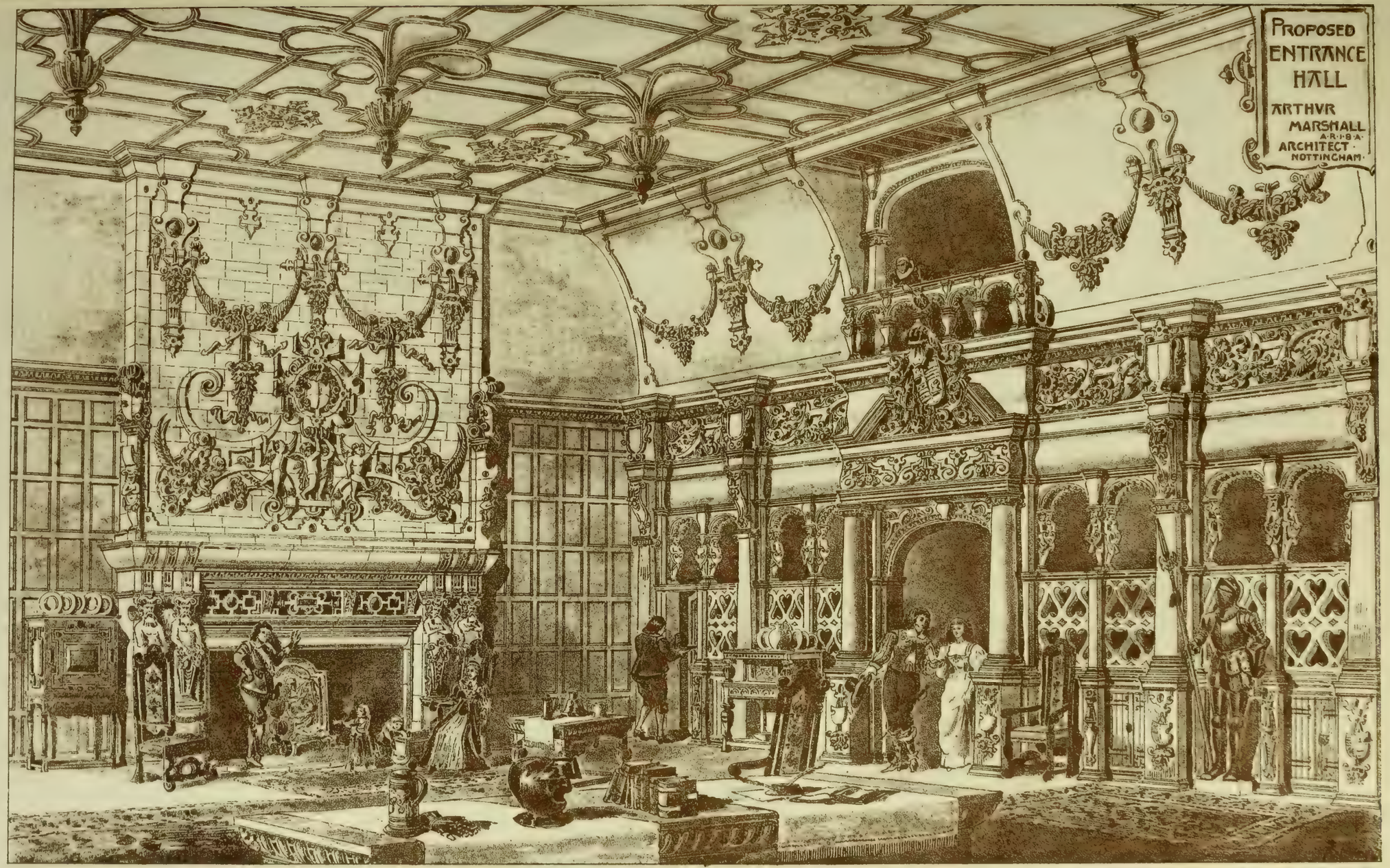
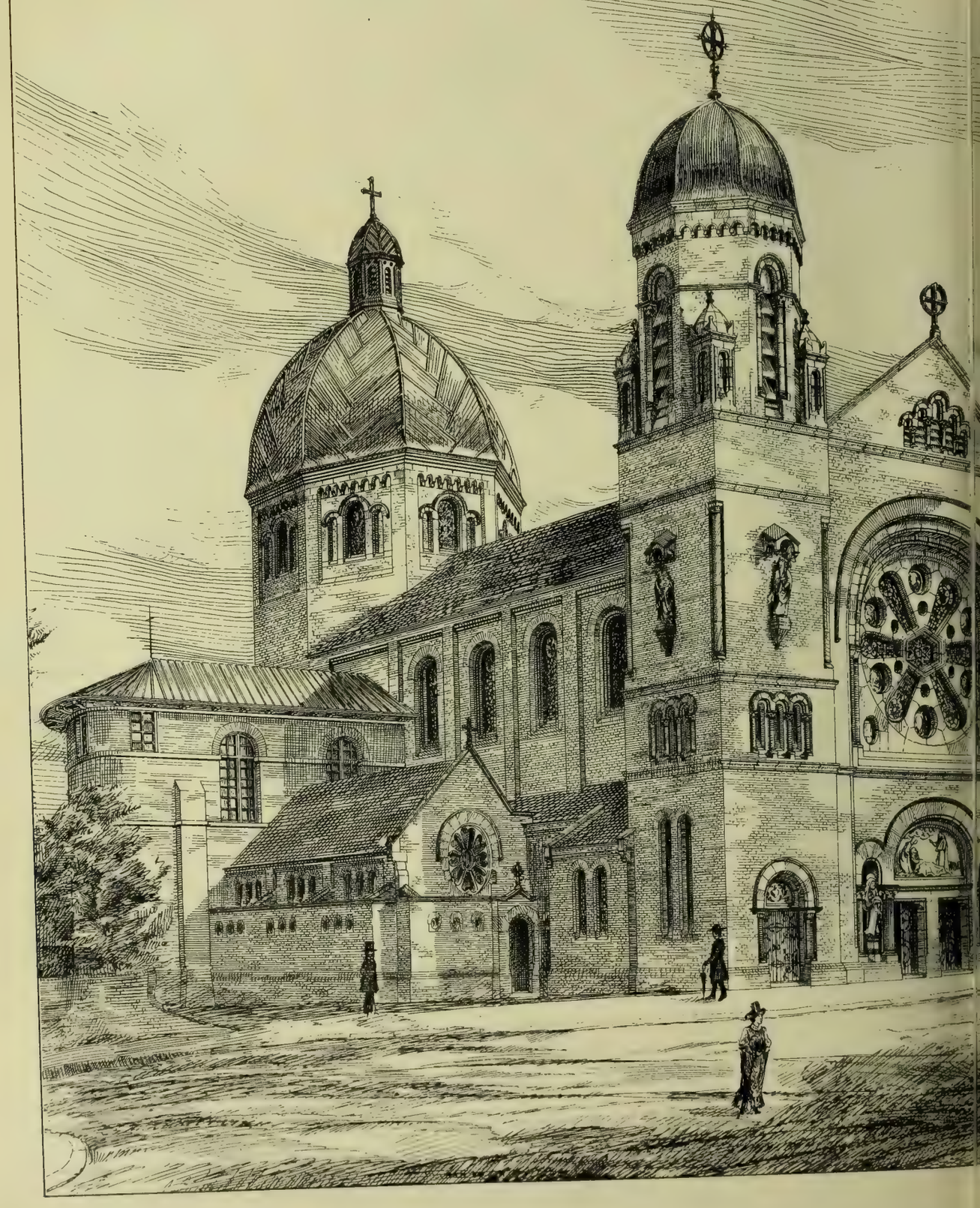
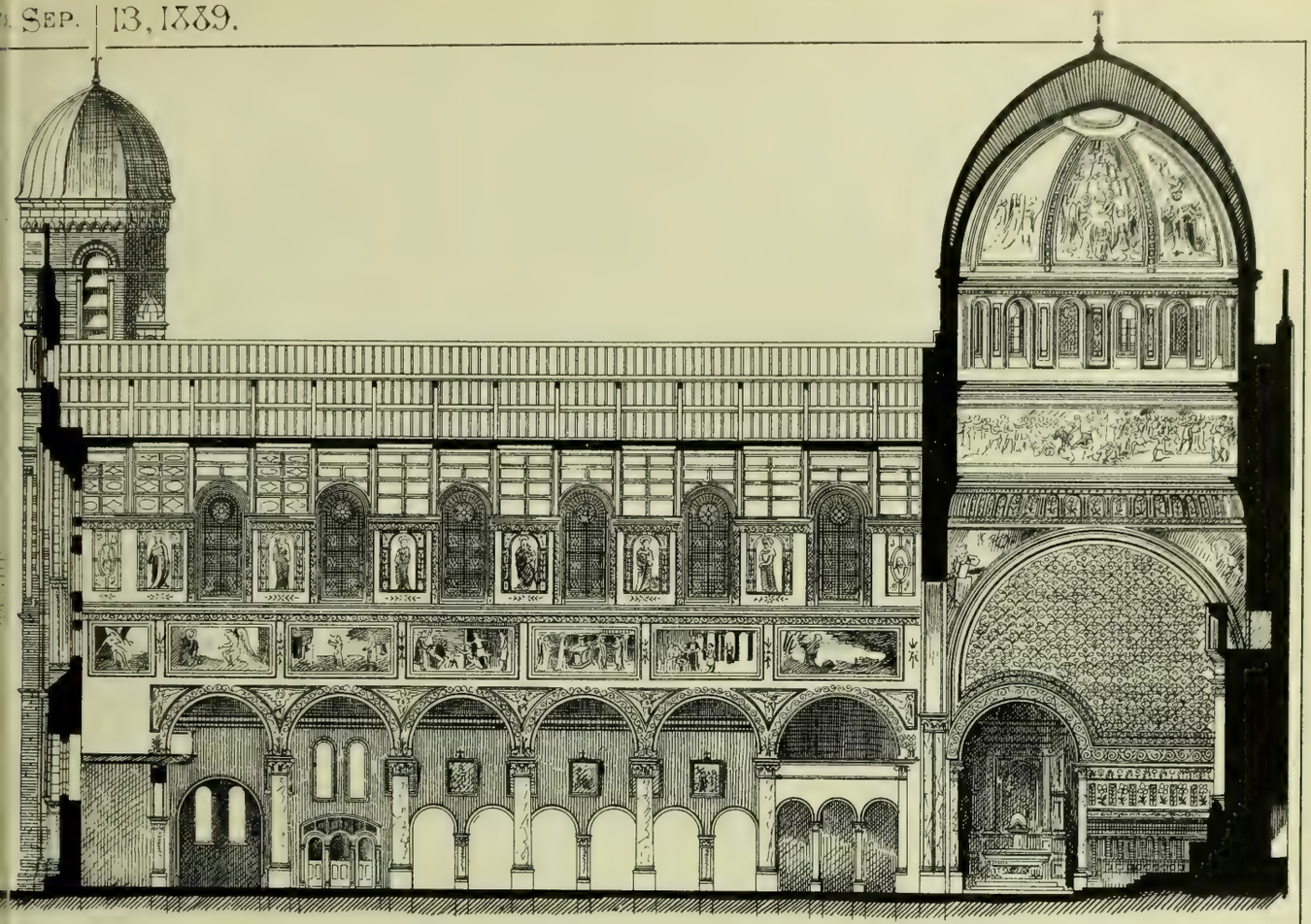


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The Memorial Church of the Sacerdotal Jubilee of Leo XIII. Dedicated to S. Joseph
Highgate Hill.
N

Albert Vicars, Architect
Somerset Chambers 151 Strand
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Longitudinal Section

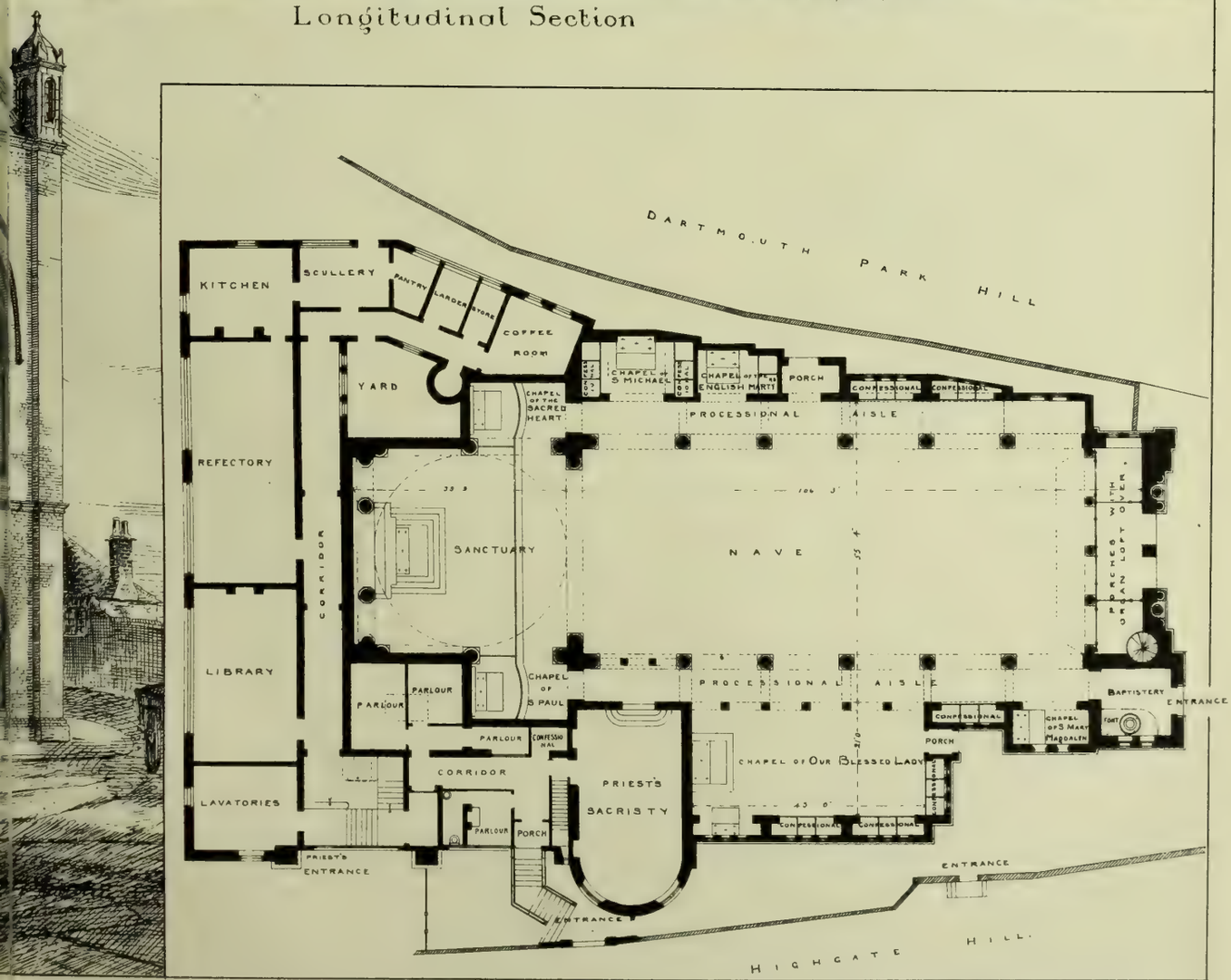
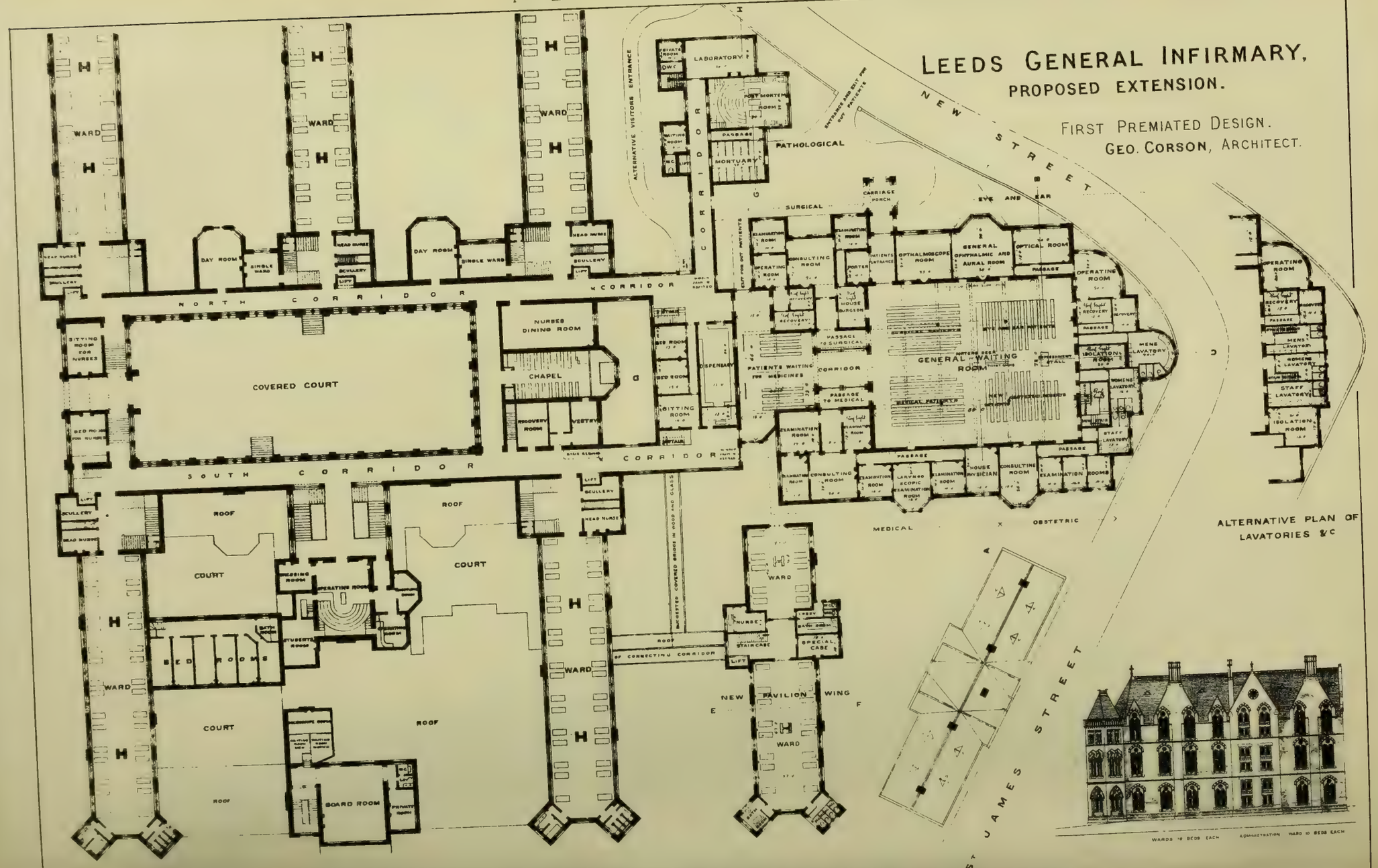


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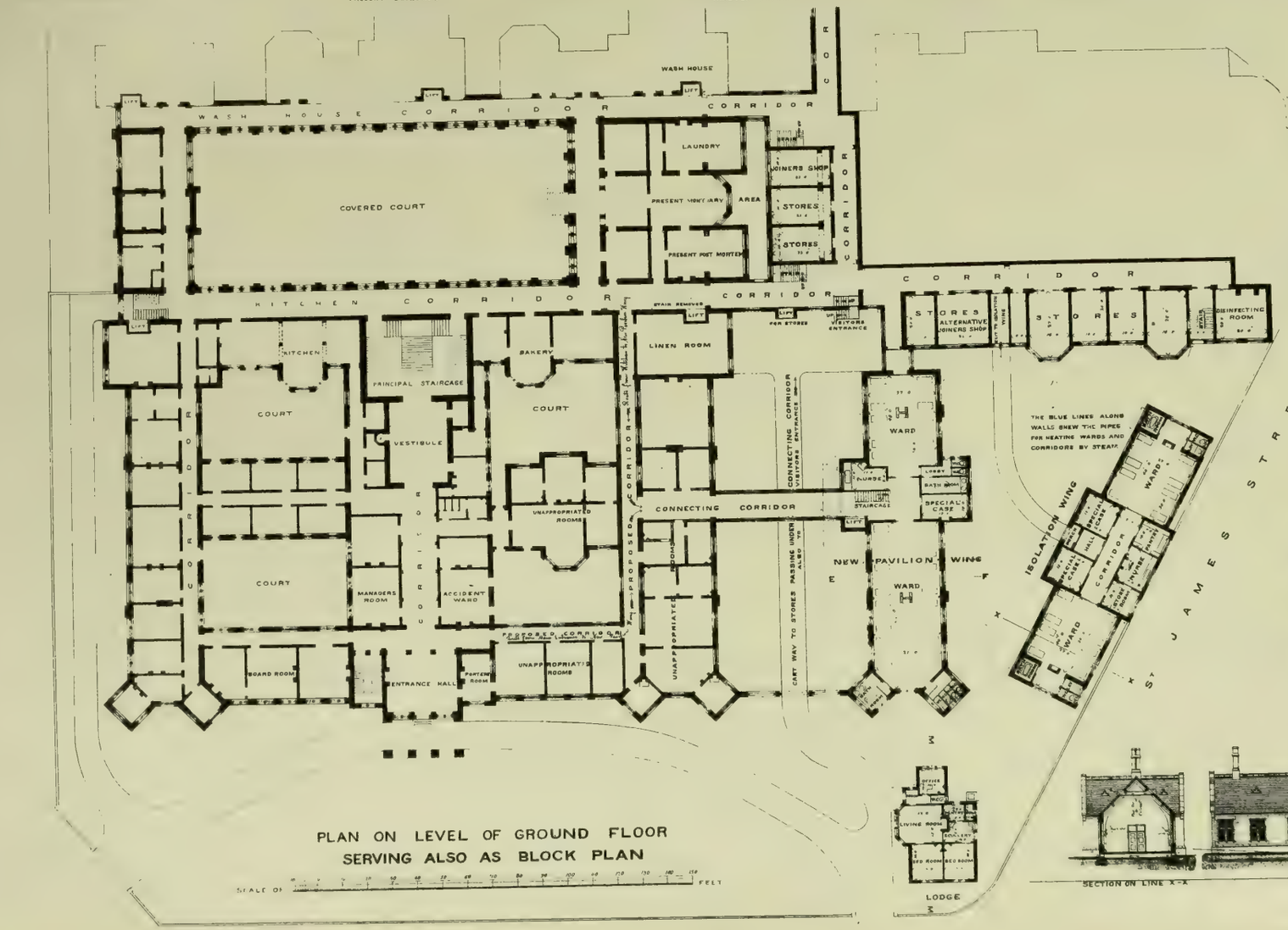
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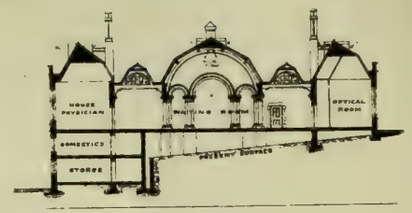
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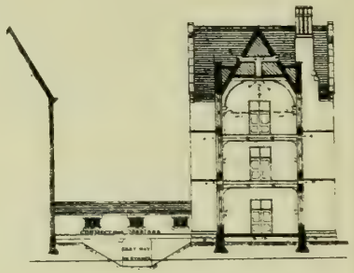


SOUTH ELEVATION

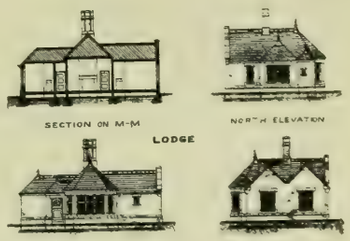




CROSS SECTION ON LINE A-B



SECTION THROUGH NEW PAVILION WING ON LINE E-F





ISOLATION WING

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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1811.
FRIDAY, SEPTEMBER 20, 1889.

ERRORS IN ARCHITECTURAL DESIGN.

WHAT not to do is, perhaps, a more practical direction in art than instruction based on positive rules. We can see mistakes when they have been committed quicker than we can discern the right way from the wrong. Rules on architectural design are often unheeded; but when once the error is made apparent, a lasting rule is engraved on the memory. So we may say that good architecture may be learned by taking bad examples as illustrating things to avoid, and there can be no doubt the best critical knowledge of architectural design is acquired by studying both the best and the worst models, so that the points of disagreement or distinction can be more readily seen and remembered. Where only the right methods are learned by seeing what is correct and pleasing, we do not readily perceive in what the difference between good and bad may consists. If the public are ever to learn architecture they must learn it in this way. But architects, too, need teaching in many points. In the following remarks we intend to point out a few of the mistakes and faulty details observed in buildings professedly designed by architects. And first let us take examples of wrong design in churches, and beginning with the most prosaic part of the furniture, the seats. What a fearful number of blunders are made in the form and dimensions of benches. Many of those who have to endure a long sermon can get no rest for the back. It is placed upright, or too nearly so, to be of any help as a rest for the spine; the seats are either too low, too high, or too wide; the kneeling board is awkwardly placed, or the foot, all of which points can be easily decided by taking a comfortable chair as a guide, or by measuring the position of a person of ordinary stature, as he or she sits at ease or leans and kneels forward. Not that we can fit everybody, as that would be impossible; but we can avoid the uncomfortable type. For instance, one sees an upright back carried up nearly as high as the shoulders, making reclining a torture. The seats are made sometimes only 12in. and even 10in. wide, whereas 13in. wide should be the least dimension with a sloped back. Then we find pews only 2ft. 6in. wide, allowing no room for standing free of the seat, and still less for kneeling. A limit of 2ft. 10in. should be the least width. The Ecclesiastical Commissioners for building churches prescribe 2ft. 8in. as the width from centres of backs, if not more than 2ft. 8in. in height, the rule being to increase the width for every inch additional in the height of back. Not only do ill-regulated dimensions inflict inconvenience on the worshipper, but the shape and finish of the bench-ends give unnecessary pain to the occupant. The bench-ends of one modern church we noticed the other day in a good London suburb were shaped in a manner dictated to arouse the indignation of the would-be comfortable sitter; the front part was sloped off, possibly to prevent resting the elbow of one sitting next the door, though we think the motive was the unintentional stupid one of making the ends ornamental, the sloped edge as well as the top being moulded. But whichever the reason was, the slanting line is disagreeable, and cannot be regarded as an improvement on the square or curved bench-end, of which there are many pleasing types. The sloped bookshelf is also an abomination; it should be square and narrow. Nor does the practised architect require to be told that the back of a seat is better left simply chamfered, and should not be moulded. But one often sees the moulding run along the top for the sake of apsearance, like the old-fashioned mahogany pew-capping which projected on each side of the framing, and was very uncomfortable to the back.

To mention a few structural matters. There are some architects who think it very immaterial in the design of churches with arcades how the arches are set out and struck. The consequence is that we see acutely-pointed arches with the radius exceedingly long, presenting in perspective a series of sharp and unpleasant points, over which the horizontal staircases and upper clerestory windows rest very uncomfortably. The equilateral is the most pointed form that is agreeable, any acuter form being undesirable. The obtuser varieties are far more agreeable, besides giving wider spacing, bearing in mind that even this form may go too far, and a look of weakness result if the piers are not massive. A common and glaring error is noticed in the springing of the archivolts. We have seen them start vertically over the pier, the arch mouldings being in a line with it, productive of a weak and unsatisfactory arcade. The fault is at once perceived when we ask the question of what use is the capital? Should it not act as a corbel? If not to extend the base of the archivolt, it is a mere ring of mouldings only serving to mark the level of springing. The abacus projection becomes a useless ledge; but when the line of arch and pier are not continuous, the members of the latter taking advantage of the break by projecting over the capital, there is a reason at once for the latter: it becomes not only a springing line, but the base for the two adjoining arches to rest upon. Hence we notice that in every old church the arch moulds spread a little over the capitals, and a more solid appearance is given to the mouldings of arcade. The capital is made not only ornamental but useful, and we can admire the boldly-projecting members of the abaci, which serve the purpose by allowing the clerestory wall to be made thicker than it otherwise would be if the diameter of the shaft was taken as the standard. What is true in Classic architecture is not necessarily true in Gothic. The notion of making the pier-shaft thickness the same as the arches and wall over, no doubt arose from the Classic rule of making the vertical lines continuous without reference to the horizontal projections; but in Gothic architecture this principle does not apply. We have in Gothic the recognition of the corbel, we can make our upper openings smaller than the lower by virtue of the arch; but in pure Classic the openings immediately come over openings, and solids over solids; the vertical piers are continuous, as in the super-imposition of columns or pilasters. At the corners of buildings indeed, where one order is over another, the right rule is to make the upper vertical line fall within the lower. Speaking of arcades, we may venture to ask of what use are label mouldings inside a church, or on an interior arcade? Precedents, we know, will be found for the practice; but the meaning they have round the exterior of an arch to throw off the rain is not apparent here. Many of our leading architects omit them. Another weakness for which no good precedent will be found is to allow two label mouldings to join at an acute angle above the capital, the members running into one another. Of course the resulting mitre is an excessively attenuated one and very ugly. We have lately seen a church (modern) in which this mistake is committed.

Good taste is often shocked by the abruptness of the junction of arches. Few things look worse, because it is positively wrong, than to find an abrupt flat arch curve stopping against a narrow pier—for example, a segmental pointed aisle arch springing from the pier-shaft of a chancel arch. To say noting of the ocular distortion of two abruptly-joined lines coming together, there is the further structural error of unequal thrust suggested. Other amenities of design would take us too far; we might fill a book with recounting them. Let it suffice to say that the pointed arch for window head is distressingly awkward when the distance between its point and the horizontal line of an aisle roof is small. A row of lancets of the same height is tolerable, especially when good old models are followed; but the acutely pointed window, without some compensatory expedients like the "drop" arch, is singularly offensive to the eye, and displeasing in any situation where it appears near the horizontal lines of a wall or roof.

We see the employment of curves in the most objectionable positions. A most grievous error is the introduction of a pediment on circular fronts and walls. The circle on a circle is the most awkward and disagreeable conjunction of lines, although in corner buildings it is nothing unusual to find the curved pediment on a circular-shaped wall. Here all raking or curved lines ought to be avoided, and if the circle is introduced in any of the features, it should be of small size, as in an arcading between two horizontal lines. Again the arch can be used redundantly. The use of the circular-headed window in every story of a façade is an error we occasionally find, producing a disagreeable kind of architectural tautology, and this monotony is the more apparent when the curves are of the same size. The stilted segmental arch is inharmonious and ungraceful when the arches are close, and on the whole it may be affirmed as a recognised principle that the arch is more agreeable when sparingly introduced, and that the repetition of straight or rectangular forms is less monotonous than the redundance of arches, especially of the same degrees of curvature.

LEVELLING.—XIX.

TAKING ANGLES — RANGING LINES AND LEVELS.

FOR rough sections the theodolite or clinometer can be used. Let us suppose a hill of varying slopes (Fig. 41). The instrument is erected at *a*, or the vertical angle *a b* taken by a clinometer, a boning-rod fixed at point *b* where the inclination of ground changes, its cross-piece being made of the same height as the axis of telescope. Having taken the angle of the first slope *a b*, enter it, and chain the distance *a* to *b*. Remove the instrument to *b*, or take the angle of depression from *b* to *a*, the latter point having a boning-rod fixed in place of the instrument, at the same height as the axis of telescope or eye of observer. Make a note of the angle, and take the mean of the two observations as the correct angle of elevation. Then it is easy to find out the horizontal distance betweeu *a* and *b* by the rule given on page 312. The height also of *b* above *a* can be found by the rule already given—namely, by multiplying the natural sine of the angle by the measured distance, so that both elements are found for correctly plotting the section. If a table of correction for hypothenusal distances is not at hand, we can multiply the measured distance by the cosine of angle, which will give the length of base of triangle. The second angular observation is made of slope from *b* to *c* in precisely the same manner, and its horizontal distance and height determined, also the angles of depression on the other side of the hill from *c* to *d* and from *d* to *e*. To expedite the labour it is better to set up boning-rods at the points *a*, *b*, *c*, *d*, and *e* at once, taking care to adjust the cross-

pieces to the height of eye, and then a double observation can be made at each point; for example, at *b* the angles *b a* and *b c* can be taken without waste of time spent in moving the rods. The reverse observation at the last rod, or the angle *e* to *d*, will be a proof of the accuracy of the work.

We may now say a word about ranging lines. If a given line of section is required for any purpose such as drainage, the extreme stations ought to be fixed by poles or flags (see Fig. 42) where points *a* and *i*, are the positions of the poles. The diagram represents a valley or undulating country, through which a line has to be taken where it is impossible to see the forward stations from the low ground. The surveyor stands a yard or two behind the first flag-pole, and sends forward a man with boning-rods or pegs with white marks, whom he places in a line

Fig. 41

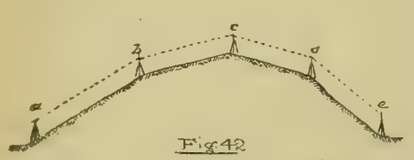


Fig. 42

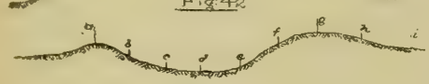


Fig. 43

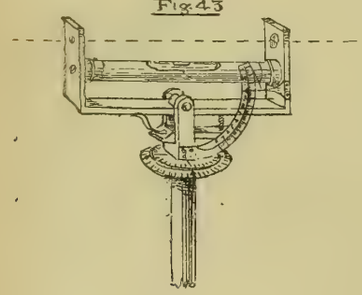
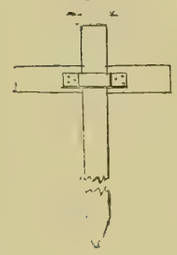


Fig. 44.



at intermediate points down the valley, at *b*, *c*, *a*, *e*, *f*, *g*, by guiding or ranging him by his hand. After fixing a rod at point *g*, on the brow of distant hill, it is easy to range the intermediate points *b*, *c*, *d*, *e*, *f*, and if trees or other impediments impede the sight of the rod-bearer through the valley, the surveyor can, by coming up to the last point ranged, direct the man in a line with *g*, and so the line can be continued by partial rangings to some fixed point forward that can be discerned, bearing in mind that at least two rods are necessary to be sighted to "bone" or range a third, and this third rod must either follow the second or be placed between the two first rods. Thus it is better to fix two rods that can be seen at a considerable distance apart, like *a* and *g*, and to range the intermediate rods *b*, *c*, *d*, *e*, and *f*. Ranging rods should be ten links long, and tapered either round or octagonal, 1½ at the largest end, divided into links by being painted white and black alternately, with red and white flags at the top; the ends should be shod with iron. Laths or sticks with a cleft at the top end for white paper, and pointed at the other end, make good ranging rods.

Another sort of rod is used by engineers and surveyors for levelling operations in ranging the bottom of trenches, and in setting out gradients; it is called the "boning" rod. These rods are often made like T-squares, the cross-piece being used to assist the eye in ranging them with the other cross-pieces, which are held up by the workman on the ground or stake. If perfectly in line the gradient or level is correct; if not, if one appears higher or lower than the third boning-rod, the stake must be drawn up, or driven in farther, as the case may be. For building operations the boning-rod is indispensable to range a level or pavement, and for sundry other purposes, as it enables a line of level to be continued to any distance. A mechanic's level may be used, such as a straight-edged rule and spirit-level on the top. Set up two boning-rods at the beginning of the line to be levelled, and another about 10ft. further, and by the aid of the cross-pieces, which are held transverse with the line and the mechanic's level, adjust the tops to a true level. These two rods being then in correct line, set up a third rod, the top of which should range with the cross-pieces of the two first; additional rods being set up at certain convenient distances apart, the line can be carried for a considerable distance. Boning-rods should be about 3ft. long and 3in. wide, and about 1in. thick, and the cross-piece may be made to slide in a slot, as shown in Fig. 44. They are preferably painted white and black. The cross-pieces may be of any reasonable length to aid the sight. A portable and very useful little levelling instrument for operations connected with building sites and other limited purposes is shown in Fig. 43, which combines a small level with sights, a clinometer, and offset staff. The vertical angles that can be measured are small but sufficient for many practical uses—such as setting out drainage gradients, formation of roadways, and levelling building ground. It was designed for the use of an architect. By means of a screw at the bottom threaded into a small lower plate, the spirit-level and sights attached thereto can be adjusted to a level or any inclination, a graduated arc attached to the lower plate giving any angle of elevation or depression. The spring below the eye-sight end enables a steady movement to be imparted. The whole instrument can be fixed by a pivot to the head of a staff or tripod, and made to revolve horizontally. Graduated plates are attached to the lower limb of instrument, and the other to the staff enables horizontal angles to be taken. For offsets and other purposes for which the cross-staff and optical square are employed, this appliance is of service. The architectural surveyor will find this little instrument, which is about 6in. long, sufficient for all his requirements, and for taking angles approximately—that is, short of minutes—it is better adapted than a more complex instrument.

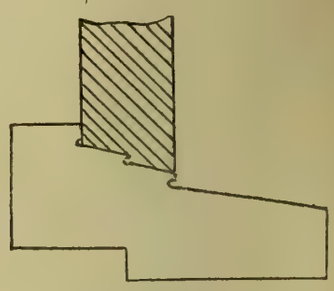
CARPENTRY AND JOINERY.—XXII.

WINDOW FRAMES AND SASHES.

THE following are some of the variations in connection with window frames of the class described in Article 20:—

Fig. 154 is a section of a sill for a window frame of a somewhat better class than that described, and the differences are: it is double rebated for the sill of the sash, and it will be obvious, that in an exposed situation this is a great improvement, as the rain, being forcibly driven against, will not so readily, if at all, leap up two checks, not to speak of the throatings. It is also seen that there is a rebate underneath the sill. The use of that is to prevent the water getting inside the house by way of between the stone and wood sills. Of course, it is to be understood that the stone sill is to be checked to suit this. The ends of the stone sill can have the check stopped, so as to be an extra preventive of water entering; but, of course, this would necessitate a long sill, and the

Fig 154

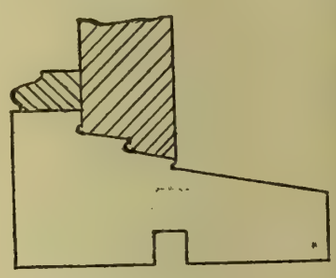


3" Scale

wooden sill would require to be checked at the ends to fit (this proceeding is not usual).

Fig. 155 shows another method of preventing water from entering between the stone and wood sills. As is seen, there is a groove in the underside of the sill. The object of this is to allow of the entry of the fillet, which has been inserted in a corresponding groove in the stone. This

Fig 155

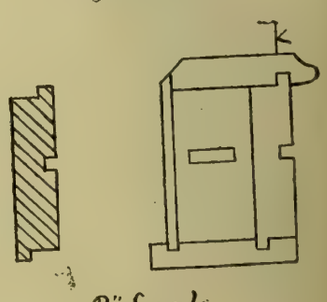


3" Scale

fillet may be of hard wood, brass, copper, or galvanised iron. The groove will vary in size according to the material used. In fact, the stone sill could be worked so that a piece might be left on to fill the groove in the wood sill; but in such a case the groove would require to be considerably larger than if any of the before-mentioned materials were used.

Fig. 156 shows a section of the stile of a better-

Fig 156



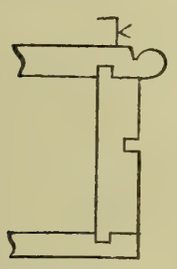
2" Scale

class frame, and such as would be adopted for the sills just now described. There is a fillet or tongue left on the outside and inside edges of the stile for insertion in the grooves of the outer and inner casings. The reason for these fillets being in the positions they are is plain. Sometimes, indeed, on the outer edge the fillet is left similar to that of the inner edge, as shown in Fig. 157; but that is rather unusual, and is not just so

satisfactory a guide for the margin of the casing. But one point is in its favour, which is, looking from inside outwards, the joint is not seen, which in the case of shrinkage would be very observable.

In Figs. 156 and 157 the outer casing shows a chamfer on its outer face and edge; this is so that, if in the corner of the *reveal* any inequalities or projections should occur, the corner being thus taken off will not be so likely to be interfered with when the frame is put in. The frames in such cases are usually put in after the building is up; not built in as in the common class of property. The mode of putting in and fastening sash-frames when the building is up will be explained presently. In the case of common property, the frames being built in serve the

Fig 157

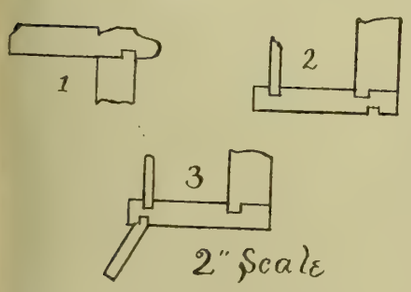


2" Scale

bricklayer as a guide, so that having the frames set plumb he keeps an equal margin up the frame and does not plumb his brickwork, which of course, otherwise he would have to do. This method also lessens the labour of the joiner, who would fix them in a very different manner.

Suffice it now to state that when frames are built in they are retained in position by the *joggles* of the head and sill, and the pressure of the lintel (and in consequence the building above

Fig 158



2" Scale

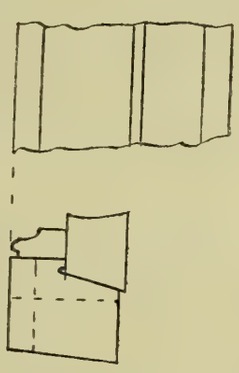
the lintel) upon the head of the frame. Two other points shown in Fig. 156: there is the back lining, which is parallel with the stile, and for which the inside casing is grooved, on the side opposite to the spectator when the frame is fixed. This lining is just inserted into the groove and nailed against the edge of the outer casing. Its use is to complete the encasing of the weights; it also serves to strengthen the frame by binding both casings together, and should any nailing or fixing be done against the inside casing it is stronger to resist. The other point is that of the *parting lath* or *pendant*, which serves to divide the weights: it reaches down to the bottom end of the *pocket piece*, and is suspended by a nail or wooden pin; the head of the frame is mortised for it, and of course this mortise will be in the plough groove of the *parting bead*, and so as to allow the *parting lath* or pendant to be $\frac{1}{2}$in. or $\frac{3}{4}$in. clear of the pulley stile. This pendant is suspended by the nail or wooden pin, which is driven in so as to rest upon the head of the frame. When the weight has to be inserted the *pendant* is pushed aside for its admission through the *pocket hole*.

It will be understood that this lath hanging thus between the weights prevents any clinking or clashing of them. In the olden time both sashes were suspended and balanced by one weight at each side of the frame. Of course, when the *cord* broke both sashes were disabled. The friction and strain upon the cord were also increased.

Fig. 158 gives three sections of casings for frames, No. 1 being an outer casing, and illustrating a provision which is made for the *keying* of the cement by means of a bevelled sinking.

Sometimes a groove is made instead. Of course, whichever is adopted it is carried up both

Fig 159



2" Scale

sides and along the head. This provision is in order that around the frame may be more weathertight. No. 2 of the figure shows a groove on the inner face of the inside casing. This is for the purpose of inserting the *tongue* of the finishing of the window, jamb lining, or other, which may be plain, or resembling shutters *square or splayed*. No. 3 of the figure shows a groove towards the outer edge of the inside casing, and this is either for that the finishing mentioned in the description of No. 2 is set further back, or, which is oftener the case, this groove is for the insertion of the tongue of the *back boxing*, which thus incloses the shutters of what is known as a *full-trimmed* or *full-finished* window.

The finishing of windows will be treated of in due course. In the mean time let it be understood that when there are shutters there is no groove towards the front edge of the inner casing, as the shutter is hinged to the casing, showing $\frac{1}{2}$in. or so of a margin.

This last sentence conveys a statement which in some styles of high-class work is not quite correct, as a *hanging stile* moulded in section is let into a groove towards the front of the casing; the groove being, say, $\frac{1}{2}$in. from the edge of the casing.

Fig. 159 gives an illustration of a kind of sill to sash-frame which, instead of being the full breadth of the stile of the frame, is rather less than the half of its width. As may be seen, the underside of the sill of the frame is weathered, the stone sill being weathered by setting it sloping to the pitch of 1in. in 12in.

Fig 160



2" Scale

The front edge of the stone sill is worked to suit the plumb-line of the wall. The sill of the sash frame is trenched out for the stile of the frame in a similar manner as is the case in the full-width sill, and the stile is keyed in with a wedge and side-nailed. A broken section of the elevation of the stile is shown, and if the lines were carried down it would be seen that part of the stile is continued down to the stone sill; this, of course, is left on when the part is cut out to fit the sill; a dotted line is shown across the sill to indicate how far the stile is let into the sill. It will be noticed that the outer face of the sill of the sash is $\frac{1}{4}$in. beyond the outer face of sash-frame sill; by this means the water which runs down the glass and woodwork is thrown clear of the sill of the frame, and, falling upon the weathered stone sill, is carried rapidly away. There is less tendency to rot in this description of sill than in those of the full width of the stiles, because of what has just been stated.

Fig. 160 gives *one* of the most, if not *the most weather-tight* kind of sills. It is seen that it is narrow, that the sill of the sash is bevel-rebated, and that 2in. square of the sill of the sash sits down in front of the sill of the frame, by which means water is completely excluded when the bottom sash is in its position. It is seen that the pulley stile is tenoned down through the sill; the pulley stile is also housed $\frac{1}{2}$in. into the outer face of the sill, so as that in the case of shrinkage there will be no unsightly opening. No difference need exist in the remainder of the *working* of the sash-frame. One other matter, however, may be mentioned, as Fig. 160 shows the stile tenoned into the sill. Sometimes the stiles are also tenoned through the head of the frame; but this will present no difficulty to the workman, two tenons generally occurring at the top end of each stile. Of course, the head should be trenched as well, say, $\frac{3}{8}$in.; this of course will, in case of shrinkage, be very serviceable, and is, of course, more air-tight.

THE BRITISH ASSOCIATION AT NEWCASTLE.

THE meeting of the British Association at Newcastle-on-Tyne was opened on Wednesday week by an address from the President, Professor W. H. Flower, on the classification and arrangement of museums, the subject being treated, as might be expected, from the naturalists', and not from the architects', standpoint. The President admitted that the non-elasticity of the grouping in a museum is usually due, not to the ignorance of the architect by whom the edifice was planned, but to the growth of vested interests within the institution.

Captain W. de W. Abney, as President of Section A—Mathematical and Physical Science—confined himself in his address to the consideration of the effect of light on matter with special reference to photography, pronouncing a decided opinion that so far as our present knowledge goes photography in colours is unattainable. In Section B Sir Lowthian Bell chose as the topic of his opening address "The Metallurgy of Iron," and in closing glanced at the technical side of education. If this meant a system by which, along with scientific instruction, manual dexterity in the use of tools or a practical knowledge of various manufacturing processes was to be acquired, he was not sanguine as to the results, and that owing to the impossibility of anything approaching a general application being practicable. He had not a word to say against the rudiments of science being taught wherever that was possible. After this the playground would be found more useful and much more popular with a schoolboy than trying to learn a trade by means of tools, which, before he had to use them in earnest, must be thrown into the scrap heap. As a national question, the attention of the Government, Imperial or municipal, ought to be directed to the importance of establishing in all great manufacturing centres institutions resembling that of the Physical College of that city. These should consist of appropriate and even handsome buildings, furnished with all the instruments and appliances required for teaching the sciences in their practical bearings on industrial pursuits. The erection and maintenance of colleges of science should not be left to the accidental liberality of the few, but should be taken in hand by the nation at large.

Several reports were presented by Mr. R. A. Hadfield, of Sheffield, and others, on the influence of silicon on the properties of steel. Up to $1\frac{1}{2}$ or $1\frac{3}{4}$ per cent. added to iron, silicon, although increasing the limit of elasticity and raising the tensile strength, does not impair ductility. On the best method of establishing an international standard for the analysis of iron and steel corre-

spondence had taken place with allied institutions.

Section C—Geology—was presided over by Professor James Geikie, who dwelt, in his introductory address, upon the results obtained during the last few years by Continental workers in the domain of glacial geology. He took the side of the glacialists, and considered that modern geological research was wholly in their favour. On Tuesday Mr. Howorth, M.P., took the opposite view; but in the discussion that followed most of the scientists present ranged themselves in the glacialists' camp. Passing over the intervening sections as of minor interest to our readers, we come to Section G—that of Mechanical Science—opened by Mr. William Anderson in an address on the molecular structure of matter, in which he insisted on the necessity of more close study by engineers of the internal organisations of the materials used in their fabrics. In this section Mr. A. W. B. Kennedy read a paper as to "Experiments on the Transmission of Power by Compressed Air in Paris, Popp's System." Remarkable results have been obtained by the Parisian line, power being transmitted for a distance of 4½ miles, for various degrees of horse-power, whilst the lack of smoke and the saving of space, as well as immunity from risk of fire, have made the new motor exceedingly popular.

WATER-GAS.

Mr. A. C. Hutchings, in a paper on "Water-Gas," stated that 300 out of 1,150 gasworks in the United States and Canada were on this system. In the discussion which followed, Sir Lowthian Bell took entire exception to the statement that the day of fuel-gas was rapidly approaching. A greater philosophical fallacy could scarcely be pronounced. He disbelieved that anything could be gained from a calorific point of view by converting fuel into water-gas.

THE MARBLE QUARRIES OF PAROS.

Mr. R. Swan, F.C.S., read a paper on "The Island of Paros and its Marble Quarries," in which he stated that the finest statuary marble, or lychnitis, varies from 5ft. to 15ft. in thickness at the quarries of St. Minas; it occurs in a bed of coarse-grained white marble, with bluish black veins. The coarse marble becomes dark in colour near the lychnitis, both above and below it, and thus the layer of statuary marble is distinctly marked off. The dark colour is due to traces of binoxide of manganese and magnetic oxide of iron. Probably the impurities have been withdrawn from the lychnitis, and have become concentrated near the edges of the adjacent seams of limestone. The rocks are much disturbed and folded, and often dip at high angles. The ancients avoided the marble lying near the axis of elevation, that being of less good quality than in other parts. A Greek company, formed a few years back to work the marble, attacked it here, where it could be got at least expense. This discredited the marble in the market, and the company failed, having spent over £160,000 in a railway, landing-pier, and elaborate installation of various kinds. There is a good deal of excellent coloured marble on the island; but not having been used by the ancient Greeks this is little known.

IMPROVED DWELLINGS FOR THE POOR.

Mr. D. G. Hoey, of Glasgow, read a paper on this subject, in which he said that in that city one-fourth of the inhabitants live in single apartments, nearly 70 per cent. in houses of one and two apartments, often with lodgers. The death-rate in such one and two-roomed houses is 27·74 per 1,000; in three and four-roomed houses, 19·45; in houses of five rooms and upwards, 11·23. The rents paid for single-apartment houses were from £4 to £5, and some £5 12s. a year. Nothing but proper accommodation at similar rents so paid for hovels would meet the case or materially lessen the great mortality. In London the best done for the poor was as follows:—A single apartment, bare walls, 10ft. by 7ft., accommodating one person, quite unventilated, £3 18s., fifth floor; £5 12s. lower down; others, 15ft. by 12ft., same discomfort, in which a couple and some children may huddle, £7 3s. at the high, and £9 2s. at the low level. These were the best examples producible of "model dwellings" of a benevolent association! Anything more wretched for model dwellings could not be imagined. In the matter of proper house accommodation, when we came to the abodes of unskilled labourers in all large cities, the relation between supply and demand failed. The enterprise of providing improved houses for the poor was a virgin field in which never a furrow had yet been turned. In proposing a method of cure, the chief points of difficulty were—(1) the cost of ground, rendering it inevitable that many such houses should be erected in a limited space; (2) providing means within such space for due separation and privacy of the sexes, together with (3) thorough ventilation, producing continuous renewal of the atmosphere, whilst (4) causing no discomfort or danger by draughts; (5) comfortable warmth, protection from cold in winter; (6) adequate privy accommodation, accessible to women and children. A seventh—adequate cubic space—had received great prominence, and legal enactment had prescribed a *minimum* of 300 cubic feet per adult. But this measure of adequacy was a dangerous delusion. The true measure of adequacy was the degree of continuous renewal of the atmosphere, and that was wholly wanting in the existing houses. He was prepared to take what cubic space could be got, facing the inevitable. The first difficulty—cost of ground—was thus removed, so far as mechanical science was concerned, whilst the third and fourth — renewal of the atmosphere without draught—could be disposed of; the fifth—comfort and protection from cold—was secured by a variety of simple devices, such as air spaces in the walls and entrances from closed and ventilated passages; and the sixth—adequate privy accommodation — was met, he claimed, in the plans. The plans proceeded on the principle of the state cabin on board ship. Given a bare room, 15ft. by 11ft. by 13ft. high, the door, 2ft. 6in. in middle of 11ft. end, left 4ft. 3in. on each side, inclosed by a partition 6ft. from the door, forming two bed-closets, or cabins, 6ft. by 4ft. 3in. by 7ft. high. The partition was carried up to the ceiling, inclosing another bed-chamber, 11ft. by 6ft. by 6ft. high. The cabins were each fitted with two berths, 6ft. by 2lin., leaving floor space 6ft. by 2ft. 6in., furnished with lockers and seat and cupboard. The bed-chamber above had a bed 6ft. by 4ft., and floor spaces 6ft. by 5ft. and 4ft. by 2ft., with 11ft. range of lockers and a large cupboard. The space left for the family room was 11ft. by 9ft. and 13ft. high. There were numerous provisions for convenience and comfort, including a cheap economical stove, that burnt slack to white powder, did the cooking, the warming, and the ventilating all at once; and every other provision had been made, down to the minutest particular, for economising space and cost of erection and of working. In the discussion that followed, Dr. Barrow, of Southport, declared that Mr. Hoey's plan was crude. Mr. Hodgkin, of London, referred to the building of working men's dwellings on the co-operative principle, and alluded to a scheme on such lines which was being successfully worked in London. Mr. Patrick Geddes, Edinburgh, pointed out that building houses for the poor was not deemed remunerative by capitalists, and that unless rich men were prepared to invest their money in such building schemes at a sacrifice, little progress could be made. He threw out the suggestion that moneyed philanthropists, instead of giving £5 towards schemes for the amelioration of the poor, should invest £500 in building houses for them at one per cent. less than they might get elsewhere, and thus do far more good.

ESTUARY MODELS.

Professor Osborne Reynolds read a report on investigations of estuaries by means of models, carried out by a committee in a tank at Owens College, Manchester. The results of their experiments up to the present were most satisfactory, and he had great faith in the agreement between the models and estuaries.

The usual Saturday night address to working men—always a popular feature—was this year delivered by Mr. B. Baker, who selected as his subject the Forth Bridge, of which he is, with Sir John Fowler, joint engineer. He announced amid applause that the bridge will be practically finished by the end of October.

CIRCULATION OF UNDERGROUND WATERS.

Mr. C. E. De Rance submitted the fifteenth report of the committee appointed for the purposes of investigating the circulation of the underground waters in the permeable formations of England and Wales, and the quantity and character of the water supplied to various towns and districts from these formations. The report stated that during the past fourteen years the recognition of the great value of our underground water stores had made wide progress, as affording efficient supplies of water to corporations, local boards, and public companies, free from organic impurity, regular or quarterly during periods of drought, yielded at a constant temperature throughout the year, and obtained, as a rule, at a smaller cost than gravitation supplies, and almost invariably at a less cost as regards legal or Parliamentary expenses. The publication of the results already obtained by the committee had been greatly appreciated by engineers and contractors, and had undoubtedly helped and supported recommendations of water supplies from underground sources. A large number of borings were annually made, and there being no other recording agency of the results obtained than those collected by the committee, they asked for reappointment; but they noted with satisfaction that numerous provincial societies were giving attention to this subject, and publishing results.

PURIFICATION OF SEWAGE BY ELECTROLYSIS.

Mr. W. Webster, of London, read a paper on "The Purification of Sewage and Water Contaminated with Organic Matter by Electrolysis." The paper was divided into four sections, bearing on the different values of the methods for the oxidation of organic matter in solution, leading up to the action produced by the electric current:—1. By natural processes due to the action of atmospheric oxygen dissolved in water. 2. By the action of the soil, due to oxygen in its pores, and also to the iron oxides therein acting as purveyors of oxygen. 3. By artificial disinfectants, represented by chemicals such as chromic acid, permanganates, chlorine, &c., chlorine having a powerful oxidising action upon all organic matter, living or dead. 4. The electro current produced by mechanical or chemical power. The fact that water and salts contained therein were easily decomposed, provided the current of electricity was of sufficient intensity, was an explanation of the whole system. The changes taking place in sewage when electrolised depended chiefly on the splitting up into their constituent parts of sodium, magnesium, and other chlorides. The electric current was adapted to filters and filter beds in such a manner that putrefaction could not take place in the pores of the filtering media, the filter always remaining clean, because the impurities were consumed as fast as they presented themselves. The oxidisable plates were by preference or various reasons of iron.

THE WATER-SLIDING RAILWAY.

Sir Douglas Galton read a paper on the "Chemin de Fer Glissant," based on information supplied by M. Barré. The two principles upon which the system was based were—first, a carriage sliding on a thin film of water introduced between the sledge-plates on which the carriage rests; secondly, propulsion of a sliding train by horizontal columns of water, acting through hydrants placed at intervals on the line. The system was originally designed by Girard in 1861, who made a line at his own private house, where he had an inclination of 1 in 20. The results obtained justified the application of the system in special cases on a paying basis. He applied for the concession for a railway from Calais to Marseilles. This concession he obtained in 1869, but he died in 1871. In 1885 M. Barré purchased the drawings left by M. Girard, and introduced an improvement which would make the system more workable. A line on this improved system had been established in the Paris Exhibition, which was about 200 yards long, and on it trains were being actually run. Sir D. Galton then described the sliding arrangement on the skates and the method of supplying water to them, the rails, and the propeller and apparatus for putting the train in motion.

Sir F. A. Abel has been elected President of the Association for next year, when the meeting will be held at Leeds; Cardiff has been selected as the meeting place of 1891, and Edinburgh for 1892.

DECORATION OF THE GAIETY THEATRE.

THE Gaiety Theatre has been redecorated upon a scheme prepared by Mr. Romaine-Walker, the architect who advised the former decoration of this popular house. The Indian style was adopted by Mr. Walker for a portion of the theatre some time ago, and this has been

now carried throughout the auditorium. The general tones are turquoise-blue, indigo, and white, and the motive adopted from a Persian vase, the circular auditorium-ceiling being an elegant adaptation of the style. The soft white ground has upon it a conventional design in two blues relieved by gold, inclosed by lines and Oriental ornament in the spandrels and pendentives, finished by a cusped fringe. The Gothic arches are cleverly made by this treatment to assimilate with the Oriental style. The picture by H. S. Marks, R.A., over the stage, as it was hardly in keeping with the style, has been covered over with oiled paper and canvas, having an arcaded pattern stencilled on it. The pillars are in the same general tints of white and blue, the capitals relieved by gold, with white ground. An Indian style of paper has been used for the private boxes, the panels of the circles being harmoniously treated in the same colours as those of the ceiling. The staircases, corridors, and others parts are in a different key; the walls are white, the dado decoration in cerise, and some very nice panel decoration has been introduced in shades of red. The draperies, curtains, seating, and carpets are in shades of blue to harmonise with the general scheme above. In the vestibule leading to the stalls the artists have very skilfully treated the decoration in a Louis Seize style to suit the architectural detail, a delicate salmon colour and silk draperies being introduced. These decorations and the upholstery generally have been executed by Messrs. Campbell, Smith, and Co., of 75, Newman-street, Oxford-street, W., under the supervision of Messrs. Romaine-Walker and Tanner. The whole work has been executed within fourteen days—a feat of decorative transformation that ought to be noted.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—LIII.

By HENRY LOVEGROVE, F.S.I., Surveyor.

A VILLAGE ELEMENTARY SCHOOL.

[N.B.—The word "Smith" should have come before Section 61 of specification last week.]

PLUMBER.

77. *Quality of Lead.*—The whole of the lead to be the best pig lead, properly milled and free from all defects, with all necessary solder, wall-hooks, lead tacks, and other materials required to make the work perfect.

78. *Lengths and Laps.*—The lead must not be laid in longer lengths than 10ft.; all laps to gutters to be not less than 5in.; aprons to laps 3in.; rolls to be 8in.

79. *Gutters.*—The gutters to be laid with 7lb. lead, to turn up 9in. on each side under tiling.

80. *Flashings.*—Flashings to be of 6lb. lead; the step flashings to be 14in. wide, and the ordinary flashings 6in.

81. *Turret.*—The upper part, also the base of bell turret, to be of 7lb. lead carefully dressed over rolls and under tiles.

82. *Water Supply.*—Pay fees to the water company for connection with their main, and complete the work in accordance with the requirements of the company's inspector.

82. *Pipes.*—The pipes to have the necessary lead collars, tacks, wall-hooks, &c. The service pipes are to weigh—½in., 6lb. per yard run; ¾in., 9lb.; 1in., 12lb.; 1¼in., 16lb.; and waste-pipes — 1in., 7½lb.; 1½in., 14lb.; 2in., 24lb. All pipes passing underground to be buried at least 2ft. 6in.

83. *Taps.*—All the cocks used to be of the very best quality; stop-cocks to be screw-down valves, with screw unions; the ball valves to be equilibrium.

84. *Service.*—Lay on the water from the main with ¾in. strong lead pipe to the cistern, and then finish with ¾in. brass ball valves with copper balls. Put ¾in. brass screw-down stop to the main as it enters the building on each side, and another stop-cock below each cistern.

85. *Cisterns.*—In a convenient position near the ceiling of each lavatory fix on stout bearers a galvanised wrought-iron cistern to contain 200 gallons, fitted with the necessary brass unions and fly-nuts, 1¼ warning-pipes.

86. *Supply.*—From the cistern carry ¾in. pipes to the w.c., lavatories, and urinals.

87. *W.C.'s.*—The w.c.'s to be fitted with Twyford's "Unitas" closet, with clean deal seats, water-waste preventers, and chain complete.

88. *Urinal.*—Put ½in. branch-pipe to urinal, with 1½in. copper perforated pipe, as weeping-pipe, fixed against the back, and a stop-cock to shut off when required.

89. *Lavatory.*—Provide and fix in the slate top 12in. earthenware lavatory basins, with washers, plugs, and chains, ½in. brass piston valves, 1½in. waste-pipes.

90. *Draw-off.*—In each lavatory provide a ¾in. brass bib-cock as a draw-off, with deal sink 2ft. long, 1ft. 6in. wide, and 3in. high, lined with 7lb. lead, the lead bossed at angles turned over edge, and close copper nailed.

91. *Leave Perfect.*—At the completion of the works test all the pipes, and leave the cisterns, water-waste preventers, basins, pans, sinks, &c., perfectly clean, sound, and in working order.

GLAZIER.

92. *Quality.*—The glass to be of the best quality, free from specks, and to be well bedded, sprigged, and back puttied.

93. *Plate.*—Glaze with British polished plate-glass the panels of doors where described, the glass to be bedded in black wash-leather, and fixed with beads.

93. *Windows.*—The windows throughout with 26oz. sheet glass of the "best" quality, the two lower squares to be ground.

94. *Screens.*—The upper lights of screens to be glazed with fluted sheet.

95. *Leave Clean.*—Leave all glass clean and perfect at the completion of the works.

PAINTER.

96. *Materials.*—The paint to be mixed with materials of the very best quality, with the best old genuine white lead, and pure linseed oil.

97. *Rub Down.*—All work to be well rubbed down between each separate coat: each coat to be a different tint, and the finishing coats an approved tint.

98. *Ironwork.*—The iron girders to have one coat of red lead before fixing, and three more coats when fixed; all other ironwork to be painted four coats.

99. *Woodwork.*—The whole of the interior woodwork to be stained, sized, and twice varnished, and all external woodwork to be knotted, stopped, prepared, and afterwards painted three coats.

100. *Dado.*—The cloakroom, staircase, and all parts of the building not plastered to have a painted dado of four coats chocolate; finish with a black line 1½in. wide.

MASON.

Box Ground Bath stone and all labour in hoisting and setting.

COPING TO GABLES.

2	1				Apex stone sunk B.S. and moulded to form a part of coping out of 3ft. 6in. by 2ft. 0in. by 1ft. 9in. set in cement.
2	2	1			Kneeler out of 1ft. 6in. by 2ft. 0in. by 1ft. 2in. sunk B.S., and moulded to form a part of coping set in cement.
2	1				Do. out of 3ft. 0in. by 2ft. 0in. by 1ft. 0in. do., but with returned moulding at end.
2	2	6	9	27 0	6in. copings moulded B.S. 2ft. 0in. wide raking, including all joints, cramps, &c., set in cement.
3	1				Ball terminal out of 12 by 12 and 2ft. 6in. high, moulded and fixing in cement, including dowels.
2	2	6		5 0	24 by 6 coping moulded B.S. set in cement as before, but level.
2	7	6		15 0	Do., but raking as before to centre gable.
2	1				Bonder sunk and moulded 2ft. 1in. by 2ft. 0in. by 1ft. 4in.
	1				Apex stone sunk B.S. and moulded as before, but bosted on face for carving.
2	3	3			
1	0				
2	0		13 0		Stone gable and all labour in sunk panel bosted for carving in gables.
5	2	1			
1	0				
2	0		20 10		
10	0				
0	7				
1	0		70 7		Do. in plain band.

BACK ELEVATION.

2	1				Apex stone to coping, as before, but 3ft. by 2ft. by 1ft. 6in., set in cement.
2	2	1			Kneeler 3ft. by 2ft. by 1ft., as before, with returned moulded end, set in cement.

Ft.	In.				
2	2	1			Bonder sunk and moulded to form a part of coping out of 2ft. by 2ft. by 1ft. 3in., set in cement.
2	2	8	0	32 0	24in. by 6in. coping, moulded B. S. raking, as before.
2	2	2	6		
		1	0	12 6	
		1	3		Stone and all labour in sunk moulded panel centre bosted for carving.
	2	1	6		
		1	0	3 0	
		1	0		
	6	1	8		Stone and all labour in quoins worked fair, 3 sides to gables above level of roof.
		1	3		
		2	6	31 3	
	2	1	3		Do. in quoins worked fair 2 sides, back elevation, average.
		1	1		
		31	6	63 3	
	2	1	1		Do. do. to front elevation.
		1	1		
		17	3	34 6	
2	2	2	1	9	Stone and all labour in moulded circular pediment over windows; back and front elevations.
			1	3	
			1	9	28 8
2	2	2	1	3	Add.
			1	3	
			1	0	12 6
2	2	2	1	4	Add.
			1	3	
			1	0	13 4
	2	2	4	0	
			1	2	Stone and all labour in moulding, forming a part of circular pediment.
				9	11 0
	2	2	4	3	
				9	
				6	6 5 Do. in plain ashlaring in do.
	2	4	0		
		1	2		Stone and all labour in moulded pediment over four-light window in front.
		1	7		14 6
		4	7		
		1	2		
		2	1		11 2 Add.
		8	4		
		1	2		
			9		7 3
		5	6		
			9		
			6		2 1 Do. in ashlaring as before.
		22	4		Stone and all labour in plain band at level of first-floor window-heads.
			7		
		1	0		13 0 Front elevation average bed.
2	2	9	9		39 0 Circular cutting in Kentish rag facing over window.
	2		9		1 6 Add.
		13	0		Raking, cutting to do.
		22	4		Stone and all labour in plain band as before at level of transom.
			7		
			6		6 6
		13	4		Add at head of ground-floor windows.
			7		
			9		5 10
	2	10	9		Stone and all labour in moulding over three-light windows, ground floor.
		1	10		
			9		29 8
		12	6		Add to four-light windows.
		1	0		
			9		9 5
	2	1	6		Do. in moulded termination to moulding bosted for carving.
		1	0		
		1	6		
					Allow for stone carver having use of scaffold.
		23	9		Stone and all labour in moulded string at level of transom ground-floor windows.
			9		
			6		8 11
	6	1	0		Add bond.
			4		
			6		1 0
		19	0		Do. in plain band at level of ground floor, window-sill, front elevation.
			7		
		1	0		11 1
		39	6		Do. in do. at level of window heads, first floor back elevation.
			7		
			9		17 4
		39	6		Bath stone and all labour in plain band at level of first-floor window.
			7		
		1	0		23 0
		35	6		Do. at level of ground-floor window-heads.
			7		
			9		15 7
		35	6		Do. do. transom.
			7		
			6		10 4
		35	6		Do. do. sill.
			7		
		1	0		20 8

SIDE ELEVATIONS.

		21	6		Stone and all labour in plain band, as before.
			7		
			9		9 5
		19	0		Add transom level.
			7		
			6		5 6
		22	3		Add sill level.
			7		
		1	0		13 0
		20	0		Add window-head, level ground floor.
			7		
			9		8 9
		15	0		Add transom level.
			7		
			6		4 4
		15	0		Add sill level.
			7		
		1	0		8 9

Ft.	In.	Ft.	In.	
2	12	6		
		7		
		9	11	0 Stone and all labour in plain band.
2	7	0		
		7		
		1	0	8 2 Add sill level.
2	5	6		
		7		
		9	4	10 Add.
21		6		
		7		Add (other side elevation a part timesed
		9	9	5 with last).
17		6		
		7		
		6	5	2 Add.
22		0		
		7		
		6	6	5 Add.
16		3		
		7		
		1	0	9 8 Add.
18		6		
		7		
		6	5	8 Stone and all labour.
18		6		
		7		
		1	0	10 9 Add sill level.

JOINER.—FLOORS.—GROUND FLOOR.

50	6	Flooring with three deal blocks laid in Stockholm tar and concrete 6in. thick levelled
22	6	for same, and hard brick core 12in. thick.
2	5	6
		9 Ddt. floor and concrete, &c., where wall.
2 ½	3	9 Ddt. floor and concrete, &c., for chimney
	4	3 angle breasts.
2	4	0
	1	9 Ddt. deal floor only for hearth.
2	8	0 Raking, cutting, and waste on deal floor.
2	1	Cutting and fitting deal block floor to iron stanchion 2ft. 6in. girt.
2	20	0 Add floor and concrete and hard brick core
	15	3 12in. thick. 2. Class-room.
2	5	6
		9 Ddt. floor and concrete, &c., for wall.
2 ½	3	9
	4	3 Ddt. floor and concrete, &c., angle chimney.
2	4	0
	1	9 Ddt. floor only for hearth.
2	8	0 Raking, cutting, and waste on deal 3in. flooring.
	21	0 Add floor and concrete, 6in. thick, as before,
	19	0 and dr.
	4	6 Ddt. floor and concrete, and do. for chimney-
	1	2 breast.
	3	3
	1	0 Ddt. for hearth deal floor only.
	15	0 1½in. yellow batten floor, ploughed and tongued
	29	6 with hoop iron, and laid rough, splayed headings, Kindergarten.
	5	0
	1	2 Ddt. do. for chimney-breast.
	3	6
	1	6 Ddt. for hearth.
	3	0
	1	2 Add in doorway.
	3	0
		6 Add in do.
	15	0
	5	9 Add in cupboard.
	7	0 Glued and mitred margins to hearth.
	50	6 1¼in. deal floor, ploughed and tongued, as be-
	22	6 fore, girls' school-room.
2	5	6
		9 Ddt. for wall.
2 ½	3	9
	4	3 Ddt. for angle chimney-breast.
2	4	0
	1	9 Ddt. floor for hearth.
2	8	0 Raking, cutting, and waste on floor.
2	1	Cutting and fitting or notching 1¼in. deal floor to iron stanchions.
	8	6 Glued and mitred margin for hearth.
2	21	0
	15	3 Add floor for two class-rooms.
2	5	6
		9 Ddt. for wall.
2 ½	3	9
	4	3 Ddt. floor for angle chimney.
2	4	0
	1	9 Ddt. floor only for hearth.
2	8	0 Raking, cutting, and waste on floor.
	8	0 Glued and mitred hearth.
2	3	0
	1	2 Add floor in doorways.
	21	0
	19	0 Add floor centre class-room.
	4	6
	1	2 Ddt. for chimney breast.
	3	3
	1	0 Ddt. for hearth.
	6	3 Glued and mitred margin for hearth.
	14	6
	11	0 Add teacher's room.
½	3	0
	3	0 Ddt.
	3	0
	1	0 Ddt. for hearth.
	4	9
		4½ Add in recess.
	6	0 Deal mitred and glued margin.
	3	0
		9 Add floors and bearers.

6	6	Raking, cutting, and waste on do.
2	6	
	6	Add in doorways.
3	0	
	9	Add do. and do.
3	9	
5	6	Add floor in w.c.
8	6	
3	3	Add in passage.
13	0	
4	0	Add landing.
15	0	
7	6	Add do. back rooms.
3	0	
	6	Add in doorways.
		N.B.—If the floors open to 1-16in. they are to be taken up and re-laid.
		All floor boards to be stacked on the site one month after signing the contract.

TILE PAVINGS, ETC.

15	0	6in. square red tiles, bedded and jointed in
20	0	cement, including cutting and concrete, 6in. thick, and hard brick core, 12in. thick, cloak-room.
2	3	0
	9	Add in cupbd. and do. and do.
5	0	
1	0	Add do. and do.
3	0	
1	0	Ddt. for hearth tiles only.
15	0	
22	0	Add do. and do. other cloakroom.
9	3	
1	9	Ddt. do. and do. do.
4	3	
	4½	Ddt. do. do. and do.
3	0	
1	0	Ddt. floor only for hearth.
3	0	
1	2	Add in doorway.
2	9	
5	0	Add do. do. and do. boys' w.c., &c.
3	0	
5	0	Add.
2	9	
1	8	Ddt. tiles only under w.c.
3	0	
1	8	
2	2	3
	6	Add in doorways.
15	0	
14	6	Add in lavatory and urinal do. do.
5	9	
7	0	Ddt. tiles, cement, and brick core for w.c.'s.
4	0	
1	9	Ddt. for urinal, &c.
6	0	
1	9	Ddt. do. do. do. where wall lavatory.
4	3	0
5	0	Add do. do. do. other w.c.'s.
4	2	6
	6	Add in doorways.
15	0	
9	6	Add in lavatory do. do. do.
5	0	
	9	Ddt. where wall.
1	6	Circular cutting on 6in. red tiles, wall and
4	6	urinal.

SKIRTINGS.

91	6	Add boys' schoolroom.
2 47	0	Add classrooms.
41	0	Add centre do.
81	0	Add for kindergarten.
38	6	Add for cupboard.
91	6	Add girls' schoolroom.
2 47	0	Add classrooms.
59	0	Add other class-room.
42	0	Add teachers' class-room.
9	0	Add w.c.
42	6	Add for back room.
21	0	Add on landing and stairs.

MASONRY AND STONE-CUTTING.*

By LAWRENCE HARVEY.

[TWENTY-FIFTH LESSON.]

RAKING VAULT INTERSECTING HORIZONTAL BARREL VAULT.

A VAULT is raking when its generators are inclined instead of level, as in the vaults which support flights of steps. Let (Fig. 155) A′ L′ M′ B′ be the face arch on the plane of the ground line A B; let A A′ be the height, and A C the base of the raking springing line of the vault; the hypothenuse of the right-angle triangle constructed on these two lines will give the inclination of the generators of the vault. Draw these generators on a vertical plane, E G, parallel to the generators of the raking vault. The elevation on the plane E G is shown in Fig. 157. E′ G″ will be the springing line of the vault, or the trace of the plane from which the vault springs. A′ B′ will be the trace of that plane on the wall face, and G H will be the trace of the same plane at the level of the ground line. The imposts which carry the vault are inclined planes projected on plan on the rectangles A C G E and B D H F. Lastly we draw on Fig. 157, the section G″ X″ of the horizontal barrel vault penetrated by the raking vault.

Now, having drawn the arch stones on the wall face, project (Fig. 157) in L″ L‴, M″ M‴ . . . . the joint lines parallel to the springing line E′ G″. This gives their real length. In the same way we get the arrises P″ P‴, Q″ Q‴ of the extrados with their real length. There will then only remain to find the widths of the bed-joints, and of the soffits of each arch stone, and to do this the square section of the vault has to be drawn.

Square Section.—Take a plane Y″ E F perpendicular to the generator E′ G″ of the vault, it will cut the joint-lines in the points $l'' m'' \ldots$ (Fig. 157). When this plane of section is turned down round its horizontal trace, E F, the points of section will come in $l, m, \ldots$ (Fig. 156). These points are found by taking A a = E e'', K l = E l'', V m = E m'', ... and through these points the square section is drawn. Similarly the points p, q . . . . of the arrises of the extrados are found, and then the lines lp, mq, ... will measure the width of each bed-joint.

Development of the Soffit and Bed-Moulds (Fig. 158).—To develop the cylindrical soffit, rectify the square section $a\,l\,m\,b$ (Fig. 156) on an indefinite line (Fig. 158) on which carry the lengths $a_1 l_2$, $l_2 m_2$, ... equal to the lengths of the arcs $a\,l$, $l\,m$, ... (Fig. 156); then erect perpendiculars to that line, on which carry lengths equal to each part of the joint lines from the section plane (Fig. 157); take, therefore, $a_2 A_2$ = e'' E′, $l_2 L_2$ = l'' L″, $m_2 M_2$ = m'' M″, and also $a_3 A_3$ = e'' G″, $l_2 L_3$ = l'' L‴, $m_2 M_3$ = m'' M‴. . . Then draw on the development the curves $A_2 L_2 M_2 B_2$, $A_3 L_3 M_3 B_3$ of the face arch and the intersection with the horizontal barrel vault. On the same diagram draw the moulds of the bed-joints, the widths of which are found in Fig. 156, taking $q_2 Q_2 = q'' Q''$, . . .; on the face arch the end $Q_2 M_2$ will be a straight line; on the side of the vault $Q_3 M_3$ will be a curve which can be drawn with the help of an intermediate point.

Stone-Cutting.—Let L′M′Q′R′S′P′ (Fig. 155) be the stone to be cut. We have two methods. By the first, work a prism of section $l\,m\,q\,r\,s\,p$ (Fig. 156), and of a length at least equal to Q″ y'' (Fig. 157). Then, on the faces of that prism apply the soffit and bed-moulds. This will give the arrises of the two ends of the stone. The end forming the face arch is a plane; the end forming the soffit of the horizontal barrel vault will be worked with a straight edge. The other method (Fig. 159) uses bevels cut to the angles $l\,m\,q$ and $m\,l\,p$ (Fig. 156). Starting from the operation plane $l\,m$ of the soffit, the bed joints are worked by means of the bevels, and the moulds are applied as in the first method. The soffit is worked by means of a template cut to the curve $l\,\phi\,m$ (Fig. 156).

As given in the former figure, the horizontal barrel vault is supposed to be in concrete. If it be in stone, the jointing would have to be connected, as we have seen in the case of the Welsh groin.

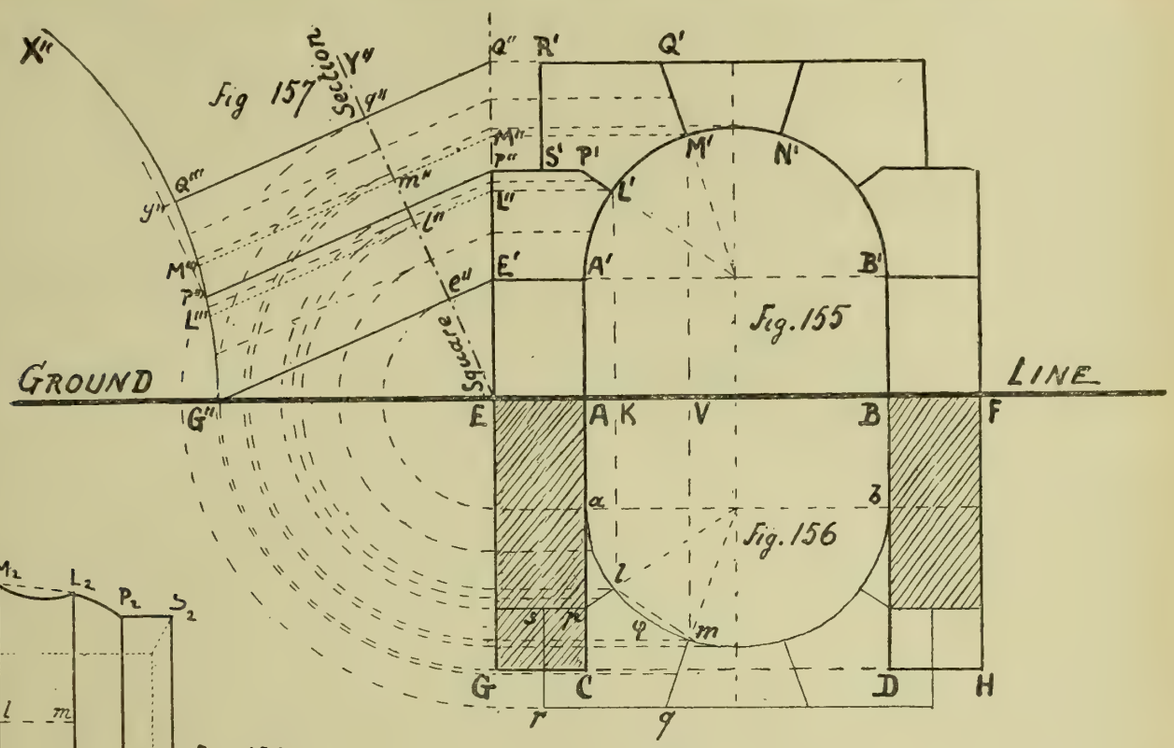
It is to be noticed that the bed-joints, as drawn, are not normal to the intrados of the raking vault. They might be made so; but then they would no more be normal to the face arch.

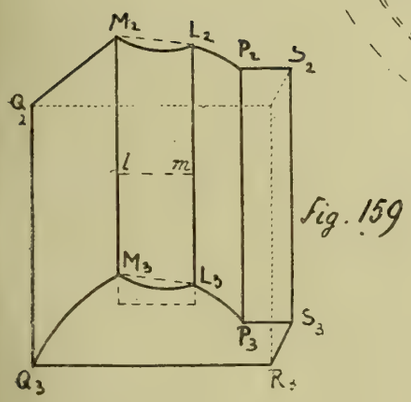
If the raking vault be of some length, then it would not be advisable to let the stones rest on raking bed-joints, for they would tend to slip down and exercise a great pressure on the horizontal vault below. To prevent this defect the arch stones should be cut as in Figs. 160, 161, 162, where the springers rest on horizontal planes, and each stone is made with elbows to hold the stone of the course above it. But, as shown on the plan of the soffit (Fig. 162), some stones, and especially the course of key-stones, should be left plain without elbows.

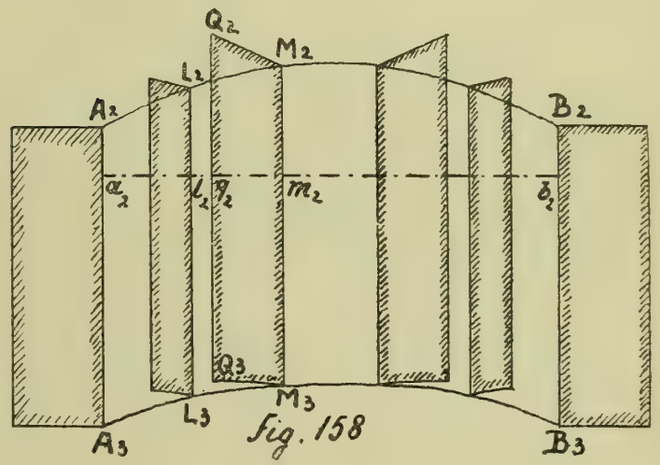
A better way of finishing the bottom end of raking vault is to use an horizontal lunette as a transition from the raking vault to the horizontal barrel vault. The appearance is more elegant, and the thrust of the raking vault is thereby relieved as in Fig. 163.

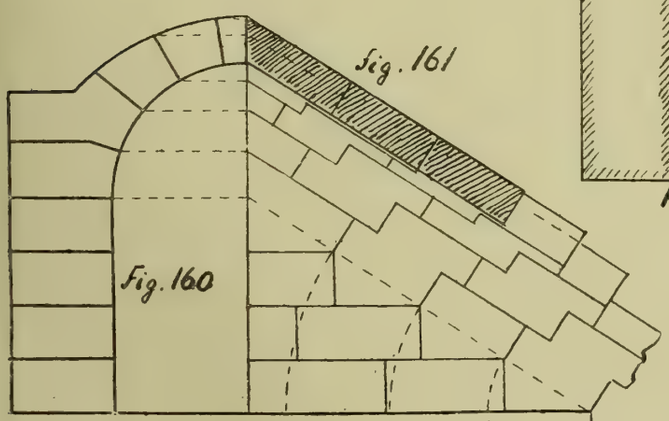
* All rights reserved.

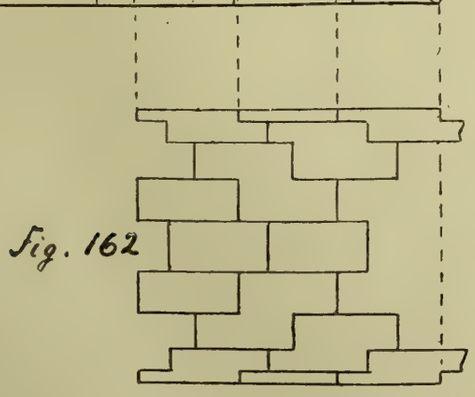
A board school at St. Andrew's, N.B., seated for 600 children, and built at a total cost, including site, of £7,961, was opened on Saturday.

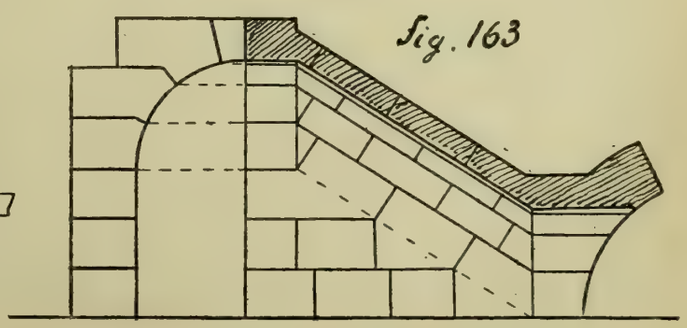

Fig 157
Section
Square
Fig. 155
GROUND LINE
Fig. 156


Fig. 159


Fig. 158


Fig. 161
Fig. 160


Fig. 162


Fig. 163

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ILLUSTRATIONS.

NEW TOWN HALL, DEWSBURY—THE CUSTOM HOUSE, KING'S LYNN—CHIMNEYPIECE, VILLA CARSTANJEN, GODESBERG-ON-THE-RHINE — "FANSHAWS," HERTFORD — ALBANY MANSIONS, SHAFTESBURY-AVENUE.—A VILLAGE SCHOOL. —MASONRY AND STONE-CUTTING.

OUR LITHOGRAPHIC ILLUSTRATIONS.

DEWSBURY TOWN HALL AND MUNICIPAL BUILDINGS.

THIS building, which was opened on Tuesday last, stands on an eminence fronting the Market-square, and is surrounded by streets from all sides, being wedge shape, with the angle cut off to gain frontage. The various departments are grouped together for convenience of working, and consist of municipal offices, reception rooms, borough court, police, school board, exchange, and large hall. The main fronts are built of Holmfirth stone, and the whole of the woodwork is of wainscot and Stettin oak. The building is lighted by electricity throughout, and fitted up with water service in case of fire. The cost of the building, including fittings, will be about £40,000. The architects are Messrs. Holton and Fox, of Dewsbury. All the doors are fitted with Messrs. Joseph Kaye and Sons' patent locks and patent automatic bolts, and their patent sliding door locks are affixed to the sliding iron entrance gates, and all are made to open with master key, with which the Mayor of Dewsbury was presented to open the hall. Messrs. Kaye and Sons also made all the door handles and furniture.

THE CUSTOM HOUSE, KING'S LYNN.

THIS interesting building, herewith illustrated by geometrical designs, was built in 1683. It is a quiet but tasteful specimen of the Renaissance in England. The architect was Henry Bell, of whom little is known. All the details and proportions are very refined, and in conformity with the Classic rules, though the pilasters of the upper order are certainly undiminished. It is, however, in its perspective mass it seems so happy, forming a most pleasing composition from almost any point of view, and more so perhaps than the geometrical elevations would lead one to suppose. The narrowing of the angle bays adds, perhaps unconsciously, to the total satisfactoriness of the result. A small woodcut of it is given in Stevenson's "House Architecture." The three centre and lower bays of the entrance front were originally open, enabling the ground-floor to be conveniently used as an "Exchange for Merchants and Shippers," while the upper floor was used for "His Majesty's Customs." Now the whole is used for Customs purposes, and the surmounting cupola serves as a look-out for vessels entering the Wash. The fronts are all of stone. Our present sheet of detailed drawings is by Mr. Chas. Oury King, A.R.I.B.A., and are the first geometrical illustrations of the building ever published. We gave a view of the Custom House in the BUILDING NEWS for Aug. 23rd last, when describing the buildings round King's Lynn visited by the Architectural Association Excursion party.

CHIMNEYPIECE, VILLA CARSTANJEN, GODESBERG-ON-THE-RHINE.

THIS refined example of modern German wood-work, from the designs of Messrs. Kayser and Groszheim, architects, has lately been executed for the dining-room of a country house which they have built at Godesberg-on-the-Rhine. The marble work was carried out by Mr. M. L. Schleicher, and Messrs. Max Schulz and Co. executed the wood carvings and decorations. We are indebted for the loan of the illustration to Mr. Ernst Wasmuth, of Berlin, who is now bringing out a valuable set of plates of Domestic interiors, representing a well-chosen series of examples of the better class of modern furniture and fittings, as well as decorations designed by leading architects and artists, who have devoted themselves to this kind of work in Germany. The title of the folio, which, when complete, will comprise eight parts of twenty plates, is simply "Der Innere Ausban," and the editors are Messrs. Cremer and Wolffenstein. The name of the publisher alone is guarantee enough as to the thoroughness with which the work has been done, and the specimen herewith, printed to a reduced scale, may be taken as a sample of the line plates. Several of the general views are reproductions in what we should call "photo tint," or photographs printed in permanent ink, and very excellently done they are. Thus, to mention one or two now before us, taken at random from the parts already issued, there is a grand door, with an elaborately carved head under an arch and surmounted by a marble bust, from the Royal York Saloon in Dorotheenstrasse, Berlin, designed by Messrs. Ende and Boeckmann, the architects; and the florid music-room from Mr. Ernst Mendelssohn-Bartholdy's private house in Jagerstrasse, of which Messrs. Schmeiden, Von Weltzien, and Speer were the architects. For our own part, speaking now more especially in reference to design, we prefer the style of work represented, in another good plate, from No. 1, Upper Alexander-street, also in Berlin, showing the staircase and hall, designed by Mr. E. Schmid; the columns and pilasters introduced give character and structural interest, and the detail shown is more reserved and correct in idea. Much of the new work in Berlin is so overdone that it soon develops into mere tawdriness and vulgarity of show. Herr von Groszheim's own dining-room in Hildebrandtsche Strasse (one of the same architects who designed the chimney-piece which we illustrate to-day) is in capital taste, with a cabinet buffet, lavatory, and door-way arranged as part of the structure. Large sheets of details of the mouldings are given, to useful scales, of this and other specimens, such as the staircase and vestibule from Messrs. Spinn and Co.'s office premises in Leipzigerstrasse, Berlin, also built from Messrs. Kayser and Groszheim's designs. The joiner, carpenter, metalworker, and carver, as well as the designer and architect, will find Mr. Wasmuth's "Der Innere Ausban" full of suggestive pieces of new work for reference.

"FANSHAWS," NEAR HERTFORD.

OUR illustrations under this head are from drawings exhibited in this year's Royal Academy. The house, built for the late Mr. H. W. Demain Saunders, J.P., is of red brick, with red Dumfries stone dressings; the staircase, constructed entirely of oak, leads out of a hall 42ft. by 18ft., also panelled with oak. The whole of the works were carried out by Mr. John Hunt, of Hoddesdon, Herts, from the designs and under the superintendence of Messrs. Jameson and Wallis, of 8, Adelphi-terrace, Strand.

ALBANY MANSIONS, CAMBRIDGE-CIRCUS, W.

THIS building, which is now in course of construction, is arranged so that the ground floor and basement can be let off as a whole or divided into smaller shops to suit the requirements of tenants. The chambers over are separated from the shops by a fireproof floor, and approached by a private entrance in Charing Cross-road, and arranged to let off in convenient suites, as will be seen from the plans. The elevation is of red brick and Bath stone, with red granite pilasters to ground floor. The design was prepared by Messrs. Martin and Purchase, architects, of 11, Queen Victoria-street, E.C., and the works are being carried out under the superintendence of Mr. H. Bailey, contractor, Highbury Gardens Estate, Highbury, N.

The contracts for the new Admiralty Offices, about to be erected from the last plan prepared by Messrs. Leeming and Leeming, architects, will be advertised for shortly, taking at first the foundations and substructure only.

COMPETITIONS.

ABERDEEN PUBLIC LIBRARY. — The town council of Aberdeen discussed on Monday the designs (seven in number) for the new library buildings which are to be erected on a site at the north end of Union-terrace. It was unanimously decided to place first the design by Mr. Alex. Brown, Belmont-street, the next in order of merit being Messrs. Matthews and Mackenzie. The cost of the building will be £7,500.

CHIPS.

On Saturday afternoon a new chancel, which has just been completed at Christ Church, Lofthouse, near Wakefield, was consecrated by the Bishop of Ripon. Plans have been prepared by Mr. W. Watson, architect, Wakefield, for the complete restoration of the church, and the rebuilding of the chancel forms the first portion of the scheme, and has cost £1,350. A new pulpit of Caen stone, a brass lectern, and other gifts have been made by parishioners. The new chancel is 35½ft. by 23½ft., the organ chamber 11ft. by 12½ft., the choir vestry 11ft. by 11ft., and the minister's vestry 11ft. by 9ft. Under the chancel is a large room, which will be used for parish purposes; and under the vestries are the heating apparatus and store-house. The style is Early English. The building is of stone, the outside facings being Delph parpoints, with Huddersfield dressings, whilst the inside is finished with Robin Hood ashlar. The interior woodwork is of red deal. The floor of the chancel is paved with oak blocks, and the vestries with deal blocks, R. L. Lowe's patent. The altar floor is covered with encaustic tiles, by Mawe and Co.

A newly-constructed large organ was opened at St. Mary's Roman Catholic Cathedral, Middlesbrough, on Sunday. The organ, which has been built by M. Amiesens, of Gramont, Belgium, at a cost of £1,200, has 2,500 pipes, 44 stops, and three manuals.

The memorial stones of a new Wesleyan Chapel at Stratton, near Boscastle, were laid on Thursday, the 12th inst. The building will be seated for 150 persons, and will cost about £9,000. Messrs. Hine and Odgers, of Plymouth, are the architects, and Mr. Ross McPherson Heard, of Bude, is the contractor.

A committee, headed by the Bishop and the Dean, has been formed to raise funds for the repair of the cloisters of Chichester Cathedral. Prebendary Clarke offers £1,000 for the purpose, with the double condition that the whole fabric of the cloisters be completely repaired and restored, and that the work be taken in hand at once.

A sub-committee of the Streets and Buildings Committee of Edinburgh Town Council have had under their consideration proposals by two india-rubber firms in Princes-street to lay, at their own expense, the foot pavement in front of their premises in Princes-street with indiarubber. It was agreed, by a majority, to recommend that the experiments be allowed.

The parish church of Lingen, Herefordshire, is about to be rebuilt from plans by Mr. Harry Curzon, of Tenbury and Lincoln's Inn-fields, W.C.

The Queen has appointed Professor Archibald Barr, of the Yorkshire College, Leeds, to be Professor of Civil Engineering and Mechanics in the University of Glasgow, in the room of Professor James Thomson, resigned. Mr. Barr is a native of Paisley, and graduated as B.Sc. at Glasgow University, where he also received the certificate of Proficiency in Engineering. In 1876 he was appointed the Young Assistant in Engineering at that university, which he relinquished in 1884 to take the Professorship of Civil and Mechanical Engineering at Leeds, from whence his services are now again transferred to Glasgow.

A cabmen's shelter in Grenville-street, Liverpool, was opened by the Mayor of that city on Friday. It has been built by Mr. Burns from designs by Mr. Parsloe, both of Liverpool.

A new recreation ground at Holsworthy, Devon, was opened on Friday. It is seven acres in extent and has on the cricket ground, of three acres, a pavilion and offices built of stone and brick at a cost of £150, Mr. John Bassett, of Holsworthy, being the contractor.

At a vestry meeting held at St. Michael's, Maidstone, last week, a design for a memorial reredos submitted by Messrs. Heaton, Butler, and Bayne, of Garrick-street, W.C., was adopted subject to the approval of Sir A. W. Blomfield, consulting architect of the church.

A contract has been entered into between the Stockport and Hazel Grove Tramways Company, Limited, and Mr. George Taylor, of Blackburn, for the construction of lines between St. Peter's-square, Stockport, and the Bull's Head Inn, Hazel-grove. The work is to be completed early in December.

WAYSIDE NOTES.

THE restoration of the Doges' Palace at Venice formed the subject of a lengthy communication to the *Times* of the 16th inst. Writing from Italy, the correspondent entered into a detailed description of the works undertaken to restore the beautiful buildings on the banks of the Venetian Grand Canal, whose glories have been so lovingly dwelt upon by Mr. Ruskin. For many years portions of this edifice have been hidden from view by unsightly hoardings, and in the article in question it is asserted that the month of November will be the latest that will witness their continuance. Visitors to Venice during the coming winter may therefore look forward to beholding the building freed from all encumbrances, and standing forth in the full glory of thorough restoration. As to the nature of this restoration, we are led to believe that it is one of the most extensive and painstaking ever attempted in modern times, the work on *one* of the world-renowned capitals having in itself occupied the attention of an accomplished sculptor for a period of something like *two years*.

Work has naturally been concentrated on the two great arcades. Here, owing originally to faulty foundations, and aggravated by that injudicious employment of iron in masonry which is the root of much, if not all, evil in the after-strengthening of buildings, and which, I see with some surprise, an enterprising clerk of works has proposed to adopt for the benefit (?) of the bells of St. Michael's Tower, at Coventry—owing to this failure of foundations, and the corrosion of iron, the exquisite capitals have had a bad time. These "Stones of Venice" have been split and broken in a most deplorable manner. The steps taken to restore them, however, and to preserve them for the delight of future generations of Ruskinites have been most thorough. The false system of iron ties, with a cross strain upon the capitals, has given place to one whereby the stress of the arches is thrown upon the springing stones, and enduring copper and bronze have been substituted for the faithless iron, so far, at least, as regards any pieces of metal secured in the masonry; for the tie-rods are of iron, being screwed to the bronzed fittings in the springing stones, and capable, thus, of being renewed when they shew signs of weakness. The capitals themselves have been most carefully repaired and restored, and bound together at neck and abacus—so far as I can understand from the description of the *Times* correspondent (apparently from the style, Mr. Stillman)—with rings of bronze.

The enthusiasm of the restorers has induced them to adopt a practice that will scandalise architectural purists, and cause even the indifferent to reflect. Our correspondent says, as if he were relating something remarkably impressive, commendable, and altogether deserving of every praise, that on the new portions of stonework in the capitals colour has been so employed as to deceive the most critical eye as to what is old handiwork and what is 19th century. The new pieces, or some of them, have actually been tinted to the colours that are of Time's brush alone—the hues of weather stains and of lichenous growths. This is at the opposite swing of the pendulum to Grimthorpean restoration. It is certainly vicious, and it is a great pity, seeing the patient plodding manner in which the Venetians have set themselves down to repair the ravages of insecure foundations and delusive staying, that they should have fallen into this error, and employed a species of deception that is particularly revolting. I don't suppose there is a vast amount of such scene-painting to be sorry for; but the fact that it has been practised at all is most galling to the sense of the architect and artist. I should like to hear the author of the "Seven Lamps," in general, and the "Lamp of Truth," in particular, wax eloquent over the subject. There is certainly scope for some picturesque writing in the matter. The bonding together of the old pieces of stone with bronze bands is strictly in accordance with Mr. Ruskin's teachings; but the painting of lichens and weather stains upon the new pieces of capitals is quite another thing.

The correspondence columns of the *Standard* have been, let us say, *enlivened* with a discussion on the very sepulchral subject of "Monumental Brasses." In an article on brasses last week, reference was made to a case where an ancient brass was *employed as a frying pan!* Heelball and lining-paper! but this shows to what base uses we may descend! A writer in the *Standard* columns, under date Sept. 16th, says he, too, was almost the witness to the use of an ancient brass as a frying pan, though was fortunate enough to rescue it, and, in the course of some years, to restore it to the proper authorities and get it replaced, with other pieces he had found, in their proper positions. Doubtless, at a pinch, a brass would make a tolerable grid; but the employment is scarcely a dignified one, as compared with the commemoration of the life of some godly prelate or worthy burgher, in the quiet aisle of some country church, or the spacious nave of an English cathedral. Strange ends are those to which the parts of old buildings are sometimes put. Only the other day I passed along a road in the Weald of Kent where I noticed a boundary mark on one side that was nothing more or less than a voussoir of some old Gothic arch, with the cusping and other work complete. As I did not examine the fragment at all critically, I cannot say whether it originally came from the west front of St. Alban's Abbey, or from some parish-church over the hop-gardens hard by.

One hundred guineas is, I suppose, the correct fee for an assessor in a large, first-class competition, and from that sum down to a £20-note there is a graduated scale dependent upon the nature of the competition, its importance, and scope. Mr. Wragge's £10 (*vide* your report of the late meeting of the York School Board), therefore, is scarcely a liberal enough offer to tempt the wily architect from his lair. Mr. Wragge had best leave the question of assessor's fees for his betters, and mind his own business. In even a small ordinary competition, if the assessor does his duty in a conscientious manner, there is a goodly amount of solid work, for which none worth their salt would feel remunerated by a sum of £10. £20 won't draw forth any architect of note, even in a small competition. £25 is a fair sum, and, being an important and generous-looking amount, will secure the services of an able assessor in a minor competition. It is a thankless task, that of assessing an architectural competition, and those that undertake it should receive adequate remuneration. One doesn't generally get much thanks from the committee, and only one out of perhaps fifty or sixty competitors will hold kindly feelings towards him. I, therefore, should put down a sum of £25, exclusive of travelling expensos, as the least for which an architect should consent to perform the services of assessor in a competition conducted on liberal lines. I hear Mr. Commissionless, of the fourth-floor "back," exclaim that he would do the job for £20, £15, or even £10, and be glad to get it; but this won't do, even if such a person stood an atom of chance of being invited to be an assessor. Assessorships are among the plums of the profession, and as such the position should be upheld with dignity and be properly remunerated. An assessorship worth having is one of the rewards that come to those who have fought the hard fight, and it affords some slight compensation for the appearance of the manifold "silver threads among the gold," *brown*, or *black*, as the particular case may be. Let us, therefore, do all we can to maintain the dignity *and the scale of pay* of assessorships; and with this end in view, we must see Mr. Wragge and his £10 to the furthermost limits of the globe.

I take up Messrs. J. C. and C. A. Buckler's admirable "Church of St. Alban," and find the opening paragraph affords one most exquisite pain in that it bespeaks of what was and will never be, and what was not and has come to pass. "Of all the grand architectural monuments of the piety and munificence of former times. or of the most deep historical interest, perhaps not one possesses stronger claims upon our attention than that which forms the subject of the present work. It is undoubtedly the most ancient that has survived the processes of early change, the inroads of time, or the insatiable enmity of sacrilege." Alas! and alack-a-day! Would that the deed of yesterday this day might be undone! Let us bewail in chorus that the abbey which possessed the strongest claim on our attention is now utterly devoid of the major part of its architectural interest, and let us together utter lamentations that no longer can its old stones be said to have survived "the insatiable enmity of sacrilege!"

An engineering treatise on the Eiffel monster is certainly very proper, and the work reviewed by you last week should have an extensive patronage among readers of the "B. N." But how about an artistic treatment of the subject? In the current number of the *Portfolio*, I see that the editor has an article on the new Parisian tower. Not having had an opportunity to peruse this essay, I am unable to comment upon it for the benefit of the reader. That it is of the greatest interest and provocative of much thought I doubt not. Few writers on pure art matters at the present day possess that peculiar vein of thought and reflection, which always affords deep interest and instruction to the architect, to such an extent as Mr. Hamerton. In his writings, even if they be upon painting pure and simple, there is to be found something that may be taken to heart for the benefit of our future work as designers; and I doubt not but that though many may be tempted to scoff at the idea of a treatise on the artistic value of the Eiffel tower, Mr. Hamerton's views upon the subject will possess exactly the same kind of interest for us as is to be found in his other works. Anyhow the essay should make the current number of the *Portfolio* additionally attractive to architects. The Westminster Abbey illustrations continue at the same high standard of excellence. I did not have an opportunity to speak of those in the August issue; but of the several large plates contained in the numbers for the last two months I much prefer the drawing of the interior of the Chapter House. In preparing the illustrations for Mr. Loftie's articles, Mr. Railton has had a severe schooling in the arranging of Early English work, and many difficult subjects to arrange; but none, I should say, gave so much trouble in the setting out and drawing as this picture of the Chapter House. The arrangement of black, white, and grey is here the subject of much thought and care, and masterful is the handling and treatment of the light and shade on that grand, central, clustered shaft that carries the weighty mass of vaulting above.

It is not, I believe, at all generally known what a musical voice this shaft of marble, in the Westminster Chapter House, possesses. If set in vibration by a good blow from a hard fist, the noble column gives forth a sonorous note that on a score of depth and grandeur of tone would be difficult to rival. Many are the slender columns, well weighted by heavy superimposed masses of masonry that emit a musical sound; but the Westminster example is quite *sui generis*. I remember, when I was let into the secret, by a kindly authority, whose name shall be unmentioned, in case he should be rebuked by those in high places for knocking the fabric of the Abbey about—I remember being greatly impressed with the beautiful sound it could give forth by reason of its nobility in silently bearing a heavy burden. The great load concentrated upon its head by way of the manifold, branching ribs of the vaulting, gives it the power of vibrating and throwing off a grand sound that lasts, perhaps, eight seconds or more. It is the reverse of a wire in great tension: it is enormously compressed, and the resultant effect is the same in both materials—only there is no comparing the twang of the wire to the voicefulness of the marble.

Returning from a short rest in a locality where we were not perturbed by the cry of the newsvendor, I was very glad to find, on taking up the *Times* early this week, that Mr. Gough had been able to get into the public press some effective arguments for the registration of architects, and I was glad to see that his arguments seem invariably to go "home" to their mark. Anti-registrationists might benefit by making an observation of the manner in which laymen express favourable opinions in discussions on this subject in the public press. I have not had any opportunity of following the correspondence on "The Smells of London," but did notice on the date when I perused the columns of the *Times* that Mr. Gough had made his writing effective. The public take to the idea of the registration of architects as naturally as young ducks to the water. It is evidently only a question of time to teach them that architects are *not* registered. There is no opposition to the idea; the evil comes of ignorance upon the subject, so very many persons imagining that the whole subject was cut and dried years ago, and that architects are as protected as lawyers or doctors. To remove this

misapprehension should be the aim of all earnest well-wishers of the registration movement, and this is best done by endeavouring, as Mr. Gough has done, and does at every opportunity, to put the facts of the case before the readers of the daily press. A little energy in this direction will soon wonderfully promote the cause of registration. GOTH.

DECORATION OF THE PORTMAN ROOMS.

THE well-known place for public assembly known as the Portman Rooms, Baker-street, have undergone considerable improvement. The Directors of the Portman Rooms Co. have, at great cost, carried out a scheme of decoration in the Italian Renaissance style, from designs and under the joint superintendence of Sir Arthur Blomfield, A.R.A., and Mr. J. S. Paul, F.R.I.B.A., the works having been executed by the eminent firm of decorators, Messrs. Campbell, Smith and Co., of Newman-street, Oxford-street. Originally bare and heavy in appearance, the Rooms have now assumed a brighter aspect. The staircase hall, level with the landings of the double flight, is in terracotta, in courses representing masonry; the upper part of walls relieved by panels of light cream and appropriate borders with the names of musical composers. The large room is generally treated in a light tone of colour—a pale lemon tint and greyish blue and gold being the keynote—and a happy gradation of tone is carried up to the ceiling. The dado is formed of Anaglypta—a kind of stamped paper, with flutings in old gold, and has a particularly handsome effect. Along the top of dado is a surbase member of stencilled swags of fruit and foliage upon a rich yellow ground. The panels, which are recessed with semicircular arches, have been very tastefully relieved; the square recesses below the cornice are filled with gold leather paper, and these will be further set off by grey plush, arranged as drapery at the sides and top. Circular spaces under the arches are in blue, delicately treated with ornament. The pilasters have Italian arabesques upon a gold ground. In the spandrels between the arches are medallions with heads of the Muses on a gold ground; and below, between the panels, are placed bevelled mirrors in handsome frames. One of the architectural improvements is the introduction of a deep cove, which has been effected by bringing down the main cornice. This alteration has the effect of heightening the room, and at the same time it improves the acoustical properties of the hall. The cove broken by ribs is decorated by stencilled patterns in light blue on the cream ground, and by ornamental designs in pale terracotta, bearing the names of the Muses directly below them. The flat portion of the ceiling, which is divided into panels of a light and decorative character, with stencilled ornament in delicate tints, has been treated to preserve height, and the colours have been selected for gas-light effects. The three octagon lanterns have also been handled in the same manner. Throughout the architraves and woodwork are in enamelled ivory white and gold.

The supper-room, which adjoins the end of the large room, has been judiciously made to contrast in tone with the large room, the predominating colours being yellow and terracotta. A high dado surrounds the room. A cove has been added, and the glass panels of ceiling reduced in area, the panels being now relieved by stencilled arabesques. The small ball-room has had also the glass ceiling altered to panels; here also there is a cove, the lines of pilasters being carried through it to the ceiling beams. The walls have Spanish leather panels with deep blue margins and dado enriched by gold mouldings.

The refreshment-room, in pale grey blue and cream and white, contrasted with yellow woodwork, is a charming little apartment, its walls being covered with Fisher and Co.s' "Muraline"—a painted paper with delicate white foliage patterns stencilled upon it. The corridor leading to Dorset-street entrance has been treated in an inlaid marble style, the decorations consisting of panels, a copy of those in the Chapel of St. Cross, by Giotto, at Florence, the effect being executed in paper, and in a very skilful and pleasing manner. These alterations have converted these dull rooms into a suite of splendid apartments carried out in one style. A private view of the decorations will take place on Tuesday, Sept. 24th inst., when the decorations will be viewed under the light to which they are generally exposed.

THE FORTHCOMING ART CONGRESS IN EDINBURGH.

THE arrangements for the second annual congress of the National Association for the Advancement of Art, to be held in Edinburgh next month, are being completed. The Marquis of Lorne has accepted the office of president of the Association for the year, and will deliver the inaugural address on Monday, the 28th October, the Congress being continued until the following Friday evening. Professor Baldwin Brown, F.R.I.B.A., has been appointed editor of the *Transactions*. Among the papers promised are those by Mr. Hole, R.S.A., "Responsibility of the Public in the Development of the Arts"; by Mr. W. D. M'Kay, R.S.A., on "Old *versus* Modern Methods of Painting"; by Mr. A. Roche, Glasgow, on "Finish in Art"; by Mr. J. L. Wingate, R.S.A., on "Drawing as a Language for the People"; in the Sculpture Section, by Mr. Onslow Ford, A.R.A., president of the section; Mr. George Simonds, hon. secretary; Mr. Alfred Gilbert, A.R.A.; Mr. G. A. Lawson, Mr. E. Roscoe Mullins, Mr. J. Stirling Lee, Mr. D. W. Stevenson, R.S.A.; Mr. Birnie Rhind, and Mr. Geo. Webster. In the Architectural Section papers are proposed on "The Art Education of the Public, including in Schools," "Landscape Gardening," "Characteristics of Scottish National Architecture and its Evolution," "Land Tenure," &c. In the Applied Art Section, a paper on "Art in Elementary Schools" is to be read by Miss Burton. Another subject in the same section is "Home Industries in Donegal"; and among the contributors are Mr. W. Morris, Mr. Walter Crane, Mr. Newburgh, Glasgow; Mr. Scott Morton, Mr. Thomas Bonar, and Mr. W. S. Black.

The programme of work in the section of museums and national and municipal encouragement of art is now adjusted. "The Political Influence of Art" will be dealt with by Mr. Philip Rathbone, of Liverpool, at a joint meeting of several sections which will be concerned with the public and municipal aspects of art. An exhibition of specimens and processes of moral paintings is being arranged, and will include specimens and objects illustrating ancient and modern processes of mural decoration to be lent from South Kensington. A joint meeting of the section with that of "Applied Art" will be devoted to art education in its various stages. The "Proper Functions and Management of Local Museums" will be treated of by Dr. Joseph Anderson; "Municipal Museums" by Mr. G. H. Wallis, curator of the excellent museum at Nottingham. An evening meeting, to be held in co-operation with the representatives of the Edinburgh trades, will also deal with the best means of making museums practically serviceable for technical education and general culture. Principal Cunningham, of St. Andrew's, will introduce the question of the Sunday opening of museums, and actual workers will be invited to give their views and suggestions as to the arrangement and management of science and art and other collections.

NEW PATENT DRAWING INSTRUMENTS.

AN improvement in the construction of T-squares and of set-squares has been invented by Mr. Mark John Lansdell, A.R.I.B.A. The patent is designed to overcome the really unnecessary frictional contact which takes place between the underside of the ordinary T-square blade and the paper on which the drawing is being made, and for the same reason set-squares, French curves, flat rulers, centrolinead, and other analogous appliances are intended to be similarly treated. The improvement consists in a filleted edge, with the arris taken off on the inner angle to permit of the instrument running readily over the heads of drawing-pins and other small objects on the board. The raised edge thus formed out of the solid lifts the main surface of the blade well off the surface of the paper, and thus must minimise the rubbing and soiling of the latter by reducing the surface of the appliance in contact with the paper to the utmost practicable extent without risking the strength of the T-square. In vulcanite set-squares the panel-fitting is formed by modelling; but in wooden ones, such as those before us, the edges are of ebony and the panel is of mahogany, with two raised ebony pins introduced to resist the pressure of the hand on the thin panel of the set square. Those who have long used the open-framed set-squares are scarcely likely to give them up for any others; but Mr. Lansdell's ingenious and simple contrivance overcomes most of the objections to those of solid form. For T-squares there can be no doubt as to the advantage secured by his patent—provided, of course, that the instruments are thoroughly well made and finished off properly.

LONDON SCHOOL BOARD CONTRACTS.

A THIRD meeting of Metropolitan builders to consider the recently adopted exclusive policy of the School Board for London, in reference to their contracts for repairs and general work, was held in the Pillar Room, Anderton's Hotel, Fleet-street, on Wednesday evening. Mr. Barnes, chairman of the Management Committee of the School Board, was present, and occupied a seat to the right of the Chairman, Mr. Lawrence Stevens, L.C.C., of Rotherhithe, and about 80 builders were present. The Chairman, addressing Mr. Barnes, succinctly sketched the change in principle of letting contracts first adopted by the Board; in place of giving out the contracts for repairs in groups of six or seven schools to local builders, as had been the case for the past two years, they were now let in divisions, eleven in all, on schedules of prices, and these had fallen into the hands of six firms. The builders of London had expostulated, and had been informed on behalf of the Board that some eighty firms were invited to tender for the divisional repairs, but he had been in communication with 143 Metropolitan builders, and only two or three had been asked to tender. The policy seemed to him to be opposed to the interests not only of builders, but also to those of the ratepayers, and so far he had been unable to hear of any grounds of complaint against the old system. No builder could afford to send long distances for trifling repairs, and it would result in subletting the works. Mr. Barnes, in reply, said the Chairman had stated the case of the London builders fairly and fully, and he quite agreed with him that the principle of centralising the contracts for repairs was unjust and unwise; if the big firms did the work at what must be in some cases, such as distant schools, a loss, depend upon it the value would be taken out of the ratepayers' pockets in another way. Only ten members of the Board were responsible for the change, which resulted from adopting without debate the report of a committee passed during the vacation, when few members could attend. The reason given him by the chairman of the Works Committee, when he inquired into the reason for the change, was that some of the small builders who got the jobs had no special man to each trade, but sent a handy man who was jack-of-all-trades, and so the work was badly done. He did not see much in this, and disapproved of the system of close tendering. As to a deputation, while he would be willing to introduce one, he did not believe they did either good or harm, and, in his experience, he never knew the representations of a deputation alter the action of a public body. Nor was it any use to hold more meetings of builders, for they were all agreed, but they must use influence with members to get the resolution rescinded.

Mr. Stonelake, ex-member of the Board, also supported Mr. Barnes's views, but thought a memorial brought by a deputation had a good effect. In reply to a question, Mr. Barnes said, it was true there was no builder on the Board: why should not they endeavour to run at the next election a builder, who would be respected by the trade, and was willing to give up his time? There were many things in which a practical man could do good work. Several persons undertook to exercise their influence with members of the Board. After some discussion, the Chairman said if, as Mr. Barnes had said, the new system had been confirmed by the full board, it would probably be a difficult and delicate matter to persuade the members to make a change immediately; for contracts had been sealed, and those firms whose tenders had been

accepted would very probably expect compensation if the bargains were upset. These views did not meet with general acceptance, several speakers urging that, even if no immediate result was effected, the agitation would have an influence at the next School Board election. The sending of the memorial was pressed on the ground that it would give members of the present board an opportunity of expressing their opinions. After further discussion, it was decided that a deputation wait on the Board to present a memorial.

CHIPS.

On Saturday evening Mr. Joseph Hughes, assistant borough surveyor for Bootle, near Liverpool, committed suicide by shooting himself with a revolver. He was under suspension for intemperate habits; but at the inquest held on Tuesday the merciful verdict of "Temporary Insanity" was returned.

The New Wynd Church, which has been erected at the junction of Crown-street and Cathcart-road, Glasgow, with adjoining hall, medical dispensary, and resident students' chambers, was formally opened on Saturday.

A memorial has just been placed in the aisle of St. Peter's Church, Dorchester, by members of the Pearce-Edgcumbe family. It takes the form of two mural tablets placed side by side, divided and flanked by fluted columns of polished Devonshire marble, with an entablature in common. It is composed of English alabaster, with carved capitals, pilasters, friezes, corbels, and scrolls. The slabs upon which the two inscriptions occur are of white statuary marble, surmounted by carved arches in alabaster, above which are cherubims. In the marble itself, and raised in low relief, are shields surmounted by mantling. The work has been executed by Mr. Harry Hems, of Exeter.

On Saturday the Bishop of Lincoln reopened the chancel of St. Andrew's Church, Billingborough, after restoration, carried out by Mr. Sherwin, contractor, of Boston. The chancel had been untouched for considerably over a century, and its condition was not only unsafe, but dilapidated, dingy, and uncomfortable. Two years ago the nave was entirely reseated, a carved pulpit erected, and aisles repaved at a cost of £800. Another £800 has now been expended in the restoration of the chancel, which includes a new roof, windows, organ chamber, and furniture.

The dredging operations in Southampton harbour, which have been in progress for more than a year, have been completed this week. Messrs. Woodhouse and Green were the contractors.

The town council of Shrewsbury considered last week a report by Mr. Baldwin Latham, C.E., on the improvement of the water supply, in which he recommended that a further supply be obtained from the Severn, with works and a reservoir at Briton. The report was received and adopted, and it was decided to seek Parliamentary powers next session for carrying out the works.

A reredos was dedicated last week in the Roman Catholic Church at Uttoxeter. It is of Caen stone, with six figures of saints carved in marble under canopies. Mr. Wall, of Cheltenham, was the sculptor, and the outlay has been over £200.

The proprietors of *Church Bells* announce for early publication a new work entitled "Notable Churches of the City of London." The book will consist of twenty-five full-page engravings, with descriptive letterpress printed on good paper. The price will be 1s.

The funeral of Mr. Philip Stephenson took place on Thursday in last week at the Southport cemetery. The deceased was in his day well known as a railway contractor, and was a relative of George Stephenson. After the Sheffield and Lincolnshire Railway had been formed Mr. Stephenson retired from business, and after that time resided chiefly at Southport. He was born at Ayton Banks, near Newcastle-on-Tyne, in 1808.

Under the will of the late Joseph Beatti, of Overley, Salop, who died last month, the Birmingham Municipal Fine Art Gallery will be enriched by three pictures by MacWhirter, H. S. Marks, and Frank Walton.

The new Mission Church dedicated to St. Saviour, at Exmouth, built from the designs of Mr. R. Medley Fulford, of Exeter, has just had an addition made to it in the shape of a font, also designed by Mr. Fulford, and, like the church, in the Early English style. It is of sexangular form, standing upon a Portland stone base, and is made of Beer stone. The bowl rests upon triply clustered columns, and its cants are carved with Early ornament. Along the top in raised letters is the text, "Suffer little children to come unto Me, and forbid them not." The work has been carried out by Mr. Harry Hems, of Exeter.

Building Intelligence.

Aberdeen University.—Extensive additions are being made to Marischal College. It stands on the site of a Franciscan convent, and was rebuilt in 1836-41 at a cost of £21,240, the late Mr. Archibald Simpson being the architect. The buildings are constructed of the native grey granite, the style being Gothic. Hitherto this fine block of buildings has been hidden out of sight, surrounded on all sides by dilapidated tenement houses, and without a frontage of any sort to street or thoroughfare, the only approach being through a narrow archway. In front, to the east, stands the main building, crowned by a massive square tower, and to the right and left are wings of the college. The present alterations and extensions are to take place in connection with the south wing, on the right-hand side of the quadrangle. This wing is to be entirely gutted and extended out to the line of Longacre. The new buildings will extend along Longacre 168ft., and will be 27ft. wide and 57ft. high. The main entrance will be by the existing doorway in the quadrangle. On the ground floor on the east side the physiological department will be accommodated as follows:—Lecture room, 47ft. by 28ft.; practical classroom, 45ft. by 25ft.; private laboratory, 25ft. by 21ft.; retiring room, 17ft. by 13ft. On the west side of the main floor the Professor of Materia Medica will be provided with a lecture room, 29ft. by 28ft.; practical classroom, 47ft. by 25ft.; professor's room, 18ft. by 14ft.; small museum, 25ft. by 21ft.; and private laboratory, 28ft. by 15ft. On the first floor, east side, the natural history department will be accommodated with lecture room, 46ft. by 29ft.; practical classroom, 41ft. by 25ft.; private laboratory, 24ft. by 25ft.; extension of natural history museum, 32ft. by 25ft.; and balance and professor's retiring rooms, each 14ft. by 9ft. On the west side there will be the medical jurisprudence lecture room, 28ft. by 30ft.; practical classroom, 43½ft. by 25ft.; private laboratory, 26ft. by 25ft.; museum, 28ft. by 15ft., and retiring room. This story will be 17ft. high clear, and the new portion of floor will be carried on sixteen rolled iron girders. The ground floor will be 18½ft. high. There will be two floors below the level of the quadrangle, sub-basement, and basement, both provided with windows to Longacre. The four lecture rooms are all to have seats, galleries, tables, and diagram frames. Fresh air will be introduced by glass hopper ventilators inserted into the windows, while the foul air will be extracted by nine powerful Boyle's patent air-pump ventilators fixed on the roofs. The new buildings will be constructed of granite rubble. The architect is Mr. W. M. Robertson, Edinburgh, Crown surveyor for Scotland, and the total cost will be between £5,000 and £6,000. Messrs. D. Macandrew and Co., Aberdeen, have been intrusted by Government with the contract for the whole of the work.

Holmfirth.—The new Lane Congregational Chapel, Holmfirth, will accommodate about 475 persons. The area will be divided by two aisles, and a gallery will extend over three sides of the building. The chapel is in the Classic style, and will be built of extra hammered outsides, with ashlar dressings for the most part, and the centre will be built entirely of ashlar, and surmounted by a pediment with balustrade. A vestry and space for organ are to be provided at one end. The estimated cost is about £2,500. The work is being carried out under the superintendence of, and from designs prepared, by Mr. J. Berry, architect, 9, Queen-street, Huddersfield.

Manchester Cathedral.—The north porch and muniment-room erected by the family of the late Mr. Alderman Craven were formally presented to the churchwardens and sidesmen of the cathedral on the 12th inst. When the scheme for the completion of the restoration of the cathedral and parish church was projected in 1872 the addition of a north porch to the fabric was considered to be essential not only to the completeness of the building, but also as a means of providing a muniment-room for the safe custody of the registers, and for an office in which the registers might be consulted. The porch and muniment-room, which have now been completed as a memorial, have been built by Messrs. Joshua William Graham and Son from the design of Mr. J. S. Crowther, architect. During the excavations for the new foundations, abundant remains of the former porch were found, and marks on the masonry of the outer north aisle, on which it abutted, showed that the ancient structure was two stories in height, of which the ground floor was vaulted. The new work consists of two bays, of which the outer one is entered by a large open archway, forming the porch proper, and the inner bay or vestibule is inclosed by moulded and traceried oak folding doors, opposite to which are the glazed folding swing doors by which the cathedral is immediately entered. Both of these bays are groined in stone, of which the vaulting ribs have carved bosses at their intersections, and all of different design. The springers of the groining are supported by moulded corbels having angels carved thereon, holding shields charged with various symbols. A moulded and traceried door leads from the inner vestibule to the registry office, which has a fireplace and dog-grate of ancient character, and an oak ceiling with moulded beams, having bosses of varied design at their intersections. A lavatory and cloak closet adjoin, and are entered from the registry office. The muniment-room forms the upper story of the porch, and its walls, floor, and ceiling are entirely constructed with solid stone, so that it is absolutely fireproof. It is 22ft. 6in. long and 12ft. 3in. wide, and is lighted by two windows at its northern end only, which are fitted with wrought-iron shutters. One side of the room is furnished with bookshelves constructed with lattice work of wrought iron. The muniment-room is approached by a winding stone staircase, and its only entrance is fitted up with a wrought-iron fireproof door. Externally the porch has been designed to harmonise strictly with the architecture of the north aisle, with which it is connected, and which is a restoration of Warden Huntington's work. The ground floor of the porch is separated from the upper story by a moulded string course enriched with pateræ, and containing an inscription of thirty-eight words, which extends quite round the porch. The internal angle formed by the junction of the walls of the porch with the north aisle contains the winding staircase, giving access to the muniment-room, which is surrounded by a lofty octagonal pinnacle, richly crocketed, and which forms a striking feature in the view of the cathedral from the north-west. The stone of which the porch is built is from two quarries, the one at Darley Dale, and the other near Carlisle.

Salisbury. — The new County Hall was formally opened on Saturday evening. The building has a frontage of 56ft. to Endless-street, and 110ft. to Chipper-lane, being somewhat irregular in its outline. The external elevations are designed in the Queen Anne style, freely treated. The fronts are of red Clarendon bricks, with moulded bricks and panels supplied by Mr James Brown, of London, and the corridors and entrances are lined with tiles supplied by Messrs. Craven, Dunnill, and Co. The staircases are constructed of Hopton Wood stone. The chief hall is 65ft. by 50ft., and is seated for 650 persons; the floor is laid with selected pitch pine, in narrow widths, with a specially prepared joint, rendering the fixing invisible. The height is 30ft. from floor to coved ceiling, and there is a stage at one end and at the other an iron balcony, seated for 100 persons. The whole of the works (except the stage fit-up) have been carried out by Messrs. Webb and Co., Salisbury, from the designs and under the personal supervision of Mr. Fred Bath, F.R.I.B.A., F.S.I., architect, Salisbury. Mr. W. Taylor, of Salisbury, has acted as contractor's foreman.

Mr. E. P. Hooley, A.M.Inst.C.E., surveyor to the Maidstone Rural Sanitary Authority, has been elected county surveyor of Nottinghamshire from among 150 candidates. Mr. Hooley was articled 13 years since to Mr. James Craik, architect, of Bristol, and after two years in practice with Mr. Frank Lean as architects and surveyors at Neath, Glam., he was elected surveyor to the Stow-on-the-Wold Highway Board, which he resigned in 1883, on being elected to the Maidstone appointment he has since held.

The memorial stone of a new U.P. church at Avonbridge was laid on the 11th inst. by Mr. J. C. Bolton, M.P. The building is being erected from plans by Messrs. A. and W. Black, architects, Falkirk, N.B. A new organ designed by the same firm has this week been opened in the Erskine U.P. church, Falkirk. Messrs. Harrison and Harrison, Durham, were the builders.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—E. L. B.—B. and Son.—C. and Co.—A. A. and Co.

"BUILDING NEWS" DESIGNING CLUB.

IN reply to the memorial letter, signed by several contributors to our Club, we are obliged by their suggestions, which will receive due consideration when the designing class is reopened next month. The award of the prizes for the past session will then be announced. Any other suggestions may now be made, and we are happy to hear from so many quarters that our Club is appreciated. We shall be glad to extend its usefulness.

Correspondence.

GRIMTHORPEISM IN THE NORTH.

To the Editor of the BUILDING NEWS.

SIR,—I fear that this dreadful complaint from which St. Alban's Abbey is suffering so much at the present time has attacked us up here in the North Riding of Yorkshire, for there is, about four miles as the crow flies south-east of Darlington in the ancient village of Eryholme, on the banks of the Tees, a poor little church which has just passed through the throes of *restoration* at the hands of the clergyman, assisted by a mason from a neighbouring village. These two worthy individuals, imagining that they were quite competent to undertake the task without the aid of any skilled professional man, set to work, with the results mentioned later on.

A few words first as to the building previous to its *so-called* restoration. The building consisted of nave, chancel, north aisle, west tower, and a south porch. It was in a very dilapidated and unsatisfactory condition, and the inside filled up with the usual ugly pews, plaster ceiling, &c. (I speak from a photo., not having been able to get inside). The restoration has resulted in entirely new roofs, floors, ceiling, pulpit, screen, vestry, rebuilding of porch, aisle, two westernmost arches, and one column, plastering of all walls inside, pointing of all outside, the breaking out of new windows, and pulling out of old and substituting new, reglazing, &c.

I do not dispute that many of these works were very necessary. Some were doubtful—such as rebuilding—and might have been avoided if in the hands of a thoroughly competent architect; whilst the breaking out for new windows in old walls, and pulling out of sound old ones and inserting new copies, I, and anyone with a love for what is old, would unhesitatingly condemn. But let us see with what taste all these were cerried out. The new roofs throughout are the most flimsy poor things, without any pretence at design, and finished with a treacly-looking varnish. One thing amused me—that was to see three corbels on each side of the nave projecting from the walls without performing any duty, there being evidently an after-inspiration to run up some struts from them to the principals. The seating is poor, the pulpit worse; and as to the screen, it will make anyone's hair stand on end. The plastering is finished off to a perfectly smooth face and neatly ruled off into blocks—to look like stone, I suppose. The vestry is very poor and bald. The eaves of the roof are simply finished with heavy, ugly projecting iron spouts, without any eaves string or corbel to carry it.

The old arcade, which is very bold, is formed of four elliptical double-splayed arches, springing from circular columns, with very good Early 13th-century cap mouldings. One has some very good early carving. The bases of some of them have the typical Early English moulding. The two westernmost arches and the columns were rebuilt because they were out of perpendicular, and the western arch, being without a label, had one added to *make it look like the rest.* All were chiselled over.

We now come to the worst of all—that is, the pulling out of small, double-light Late Perpendicular (might almost say debased) windows executed in beautiful red sandstone—one at the S.W. end of nave, the other at the S.E. of chancel—and the substituting new ones to the same design in white sandstone. There was nothing whatever the matter with these except that that they were a *little* weather-worn.

Then insertions have been made of new windows *intended* to be copies of a Geometrical Decorated window in about centre of nave—one on each side of it, the S.E. one taking the place of an ugly modern square-headed window. A trained eye can immediately detect the great inferiority of these two windows to the old, the arch of lights not being to same pitch, and the cusping has not the delicacy and finish of the old. The east window of aisle has also been tampered with. The remains of some of these unfortunate windows may be seen stuck up inside the porch.

My object in drawing attention to this church is to show how sadly a church can be mauled and irretrievably ruined in the hands of amateur restorers (destroyers) and builders who have not, and it isn't to be supposed can have, that minute knowledge and discrimination which are necessary in dealing with an ancient building, and which are only possessed by those who have spent the best part of their lives in attaining these.

If this will in any way help to put a stop to the spreading bane of Grimthorpeism, I shall be well content.—I am, &c., ARCHÆOLOGIST.

MISTAKEN ZEAL.

SIR,—I wish to call attention to a piece of vandalism which has been perpetrated in the good old town of Lancaster. Doubtless many of your readers will have stood and admired the dignified grandeur of our fine old Castle gateway tower, and artists especially will have appreciated that beautiful old weather-beaten tower, not only of the stonework, but also of the fine old oaken panelled door in the archway, and which from a short distance looked as if it was a portion of the stonework itself, so completely had its age (about 600 years) blended the colours of the wood and stone together. But alas! this is quite a thing of the past, and not for ages will the grand old pile look as it used to do of yore, for the door has been ruthlessly scraped and planed, and it now stands forward from the rest of the tower in all its nakedness, looking exactly like a brand-new door, and altogether out of harmony with its surroundings. If this had been done in order to preserve the woodwork there would have been a little sense in it; but anyone who knows anything of the peculiar nature of English oak must be aware that however old and seasoned the wood is, if the skin is taken off, a new nature is given to it, and it is just as liable to shrink and warp as when it was first cut.

To serve no practical purpose the door has been barbarously treated, and the general effect of the whole tower totally ruined, and now it only remains to put on a new polished brass knocker in place of the present ponderous iron one, in order to bring the whole thing thoroughly up to date.

Apologising for trespassing so much upon your valuable space—I am, &c.,

Sept. 14. LANCASTRIAN.

RESTORATION AT ST. ALBAN'S.

SIR,—Again we have to ask "Goth" to stick to plain truth when he is dealing with us. We have never attempted "to saddle him with an expression contained in your report of what Mr. Gough said on the occasion of the St. Paul's Ecclesiological Society's visit to St. Alban's," and we defy him to bring the slightest evidence of our having done so. We have simply cited the statement made by Mr. Gough that "the ancient painted ceiling had been stripped off," as a specimen of the misrepresentation that has disgraced this controversy. Either Mr. Gough and those who listened to him were too ignorant to know that what he showed them (and which still remains in full view) was a piece of worthless distemper—or Mr. Gough uttered, and his hearers endorsed by their silence—a wilful and deliberate lie. Now "Goth" has been on the spot, and had the opportunity of inspecting this fine specimen of a painted ceiling, with the result that he has had to descend to the miserable evasion that "visitors to St. Alban's Abbey are led to make this inference" (i.e., that an old painted ceiling was pulled down) "from the information vouchsafed by attendants at the Abbey." But surely Mr. Gough and "Goth" are not dependent on the attendants for what they know of St. Alban's Abbey, and if the attendants at the abbey can so delude ordinary visitors, surely they could not deceive "Goth." And if it be true that such is the information vouchsafed to visitors, it is surely time the information was corrected by those in authority. At the same time it might be as well to instruct "the attendants at the Abbey" to stop such disgraceful doings as brutally (we borrow the word from "Goth") wrenching off the carved pateræ on the new oak lobby-screen, and smashing off the cusps on St. Cuthbert's screen, which were afterwards found by our foreman on the cornice above. It takes some time and a good deal of force to tear off oak pateræ bradded on with inch steel brads; the mouldings above and below show the indentation made by the bar used, and it seems scarcely possible that such wanton and wicked destruction could be accomplished without the collusion of "the attendants at the abbey."

And now, Sir, if "Goth" and his friends generally are so certain that Lord Grimthorpe's work is "the greatest architectural abortion the world has witnessed," why do they not represent it, whether in speaking, writing, or sketching, *exactly as it is?* Instead of this, they speak and write lies with the most unblushing effrontery and sketch the "sheet of contrasts." Let us begin, as "Goth" does, with the north transept. How is it that the old Norman windows, which have not been touched except to put in two Roman tiles in the crown of the arch of one window, have, in the sketch of the new north transept, jumped much closer to one another than they are represented in the old? How is it that the entrance door has travelled much nearer to the turret in the new than it is shown in the old, though it has never been moved? The width between turrets at base is 32ft., the width of turrets 11ft. 3in.; put the dividers on the sketch and see whether there is a misrepresentation there.

Turning now to the south transept, what is the thick line about half the width of the mullions, running through the upper portion of the lancet window, as shown in the sketch? There is no such thing to be seen in the window itself. The sketch of the old south transept shows the supposed old slype to reach nearly half-way up the front. The external wall of the slype has not been disturbed in any way except to put one course of stone on it; we laid the sill of the five lancet windows above the old slype before the slype itself was touched. Now compare the slype in the sketch of the new south transept with that of the sketch in the old transept. The circular window in the north transept is drawn

flat as an elevation, and is an utterly impossible view of it, and the same may be said of the Abbot's porch. By the bye, if "Goth" had looked just inside the porch, he would have seen that it was protecting some *really* ancient woodwork. The "old slype door," so called, is lying in a place worthy of it; but it is a pity "Goth" missed it, he might have shed a tear over its missing "interesting ironwork dating from 1155 to 1160." The buttresses on the south side are correctly drawn; but only because it is hoped that their meaning is as unknown to the rest of your readers as it is to Messrs. Gough and "Goth." In short, Sir, the sheet of contrasts was deliberately designed to misrepresent, and that it has fully succeeded is the highest compliment that can be paid its author, who, significantly enough, has never attempted a word in its defence, and its advocates can evidently swallow a remarkably large sized camel—hump included—without the slightest straining.

Of course, Mr. Arthur Baker does "possess the modesty of true genius" (as equally, of course, "Goth" knows all "the architectural abortions of the world"), and, with a view to displaying that modesty and covering himself with glory, proceeds to make an exhibition of the most impudent presumption. For answers to sundry of his questions, we refer him to the back numbers of the BUILDING NEWS. We have not yet heard that any "clerk of the works has designed the details," of *this* cathedral at all events. "The exquisitely-moulded and carved fragments of the western porches" that are still to be seen there, he is unable to recognise, for all his admiration of them. Does he mean to infer that the architect whom Lord Grimthorpe had intended to employ was not "a righteous and competent architect"? or does he think it reasonable that Lord Grimthorpe, being perfectly competent, as he has proved, to carry out a work like that at St. Alban's Abbey with such success that *his opponents are unable to distinguish the old from the new work*, should simply hand over to someone else the spending of his money to carry out the someone else's ideas instead of his own?

Of course, Mr. Baker could have done very much better than Lord Grimthorpe; but it is unfortunate that when he "had the privilege of working under the architect whom Lord G. employed in his unregenerate days," the said architect had to confess that "the job was never looked into as it ought to have been," and to acknowledge in the matter of the nave roof that he had been completely deceived by his own clerks. But, then, Sir G. Scott was great enough to acknowledge when he was in the wrong—it is the lesser lights of the profession who claim infallibility, and in the matter of St. Alban's Abbey have thereby made themselves profoundly ridiculous. For obvious reasons we forbear saying more on this subject, and content ourselves with asking Mr. Baker whose trumpet *he* is blowing?

Apropos of what is Mr. G. G. Poston's letter and sketch? The sketch certainly shows him to be a better draughtsman than Mr. Steinmetz; but to make it correct he should have drawn it without the cusps, which he says have been "chopped away." Who was the destroyer here? Who is responsible for "the rude brick arch which spans the entire width for the purpose of supporting the superincumbent mass of renewed brickwork"? What would have been said of Lord Grimthorpe if he had had his work done with ordinary stock bricks? And what would have been said of his builders if they had underpinned stone buttresses with bricks on edge and bricks on end? The work would disgrace an ordinary labourer—even the intelligent one who filled in his time-sheet, "Chipping and carving within and without, stopping up holes, and messing about."

Finally, Sir, permit us one word of thanks to "M." for expressing *his* opinion that "the St. Alban's work is wrong," for his opinion is, of course, decisive, both as to the work at St. Alban's and Sir G. Scott's intentions elsewhere.
—We are, &c., WM. LONGMIRE AND CO.

34, Osnaburgh-street, Regent's-park,
London, N.W., Sept. 18.

ARCHITECTURE IN NORFOLK.

SIR,—I see you have lately been giving some excellent drawings of work in Norfolk, for which I, among many of your numerous readers, have to thank you. So far as I know, however, no drawings have ever been published of Ranworth Church, on the Broads, not far from Wroxham. It is, comparatively speaking, little known; but the building contains some wonderfully interesting screens, &c., with Albert Dürer-like decorations and figure paintings. Unfortunately, I have no drawings which I can send you, and the object of this note is to ask if others, more able with the pencil than I can pretend to be, will send you some detailed sketches with a view to their illustration in your most useful pages.—I am, &c., ONE ON THE BROADS.

OUTSIDE LABOUR.

SIR,—I notice in the remarks of "Goth," in referring to the new arrangement between the London School Board and their builders (page 348, *ante*.), that "it always seems to him a pity to employ outside labour and capital to the disadvantage of local industries and prosperity." My object in intruding is to solicit the aid of "Goth's" racy and powerful pen to discourage the practice—unsatisfactory alike to architect, client, and workman—of employing "outside labour"—i.e., quarry labour—in the working of stone used in our buildings. Without entering into the merits of quarry labour *versus* labour employed on the job, I would point out that in most cases it would be easy for the gentlemen of "Goth's" profession to render the craftsmen of my trade an invaluable service by inserting a clause in their contracts to enforce the working of stone on the job or in the yard, under the architect's own supervision. Another very great boon architects could render the humble instrument who delineates and hands down to posterity their ideas in stone would be to adopt a similar clause in their contracts as that now in use by the London County Council, to secure fair wages and working hours for the men.

Sir, in asking this I cannot believe that I am asking too much of the profession which my trade venerates and respects in the highest degree, or that I shall be considered as "faced all round" with impudence. I know, by a long acquaintance with the "B. N.," that the architectural profession is as much attached to its 5 per cent. as my trade is to its full current wages, and I am also aware that the profession is sadly harassed by bogus, inferior, and cheap interlopers, who claim to be architects. It is in the knowledge of this that I have made bold to solicit the help of "Goth" and his friends to better the condition of my fellow craftsmen.—I am, &c.,

STONIO THE STONECUTTER.

CHIPS.

Mr. John Heywood, of Deansgate, Manchester, has been intrusted with the complete furnishing of the laboratory fittings, free library, Denton; also of All Saints' R.C. schools, Oaklands, Liverpool, and church schools, Kearsley Moor, Stoneclough.

We understand that Meopham Court, the property of Mr. J. W. Crookes, has been sold by Messrs. Osborn and Mercer, of London, with about 436 acres of land, to Mr. Ralph Twedell, who has for some time past been renting Provender, near Faversham. The Meopham Court estate comprises about 1,350 acres, and, as will be seen from our advertising columns, about 170 acres of building land adjoining or near to the station at Meopham are going to be offered by auction at Gravesend on the 9th of October, in small lots of two acres and upwards, for which there is sure to be considerable competition. The remainder of the estate, we are informed, will be retained by Mr. Crookes.

The memorial stone of a new mission hall, to be erected on the Dudley-road, for St. Luke's parish, Wolverhampton, was laid last week. The cost is estimated at £600. The building will provide accommodation for 200 persons, and is intended for a school and for church services. The builders are Messrs. Bradney and Co., and the architect Mr. J. Lavender.

The Manchester New Synagogue and House of Learning, which has been erected in York-street, Cheetham, at a cost of about £4,000, was opened and duly consecrated on the 12th inst. in accordance with the Hebrew ceremonial.

A tablet bearing the following inscription has just been placed inside the church at Old Blair, N.B.:—"Within the vault beneath are interred the remains of John Graham, of Claverhouse, Viscount Dundee, who fell at the battle of Killiecrankie, 27th July, 1689, aged 46. This memorial is placed here by John, 7th Duke of Athole, K.T., 1889."

The new offices for the Cheshire Lines Committee, at Warrington, are warmed and ventilated by means of Shorland's patent Manchester grates, supplied by Mr. E. H. Shorland, of Manchester.

Intercommunication.

QUESTIONS.

[10089.]—**True North.**—I shall be glad if any of your correspondents will inform me how many degrees the compass now points to the west of the true north in this country.—NICHOLAI FILIUS.

[10090.]—**School Closet.**—Kindly inform me what system is now found to be most effectual for school closets? Earth closets require such constant care, they seem seldom to answer well in practice, however correct in principle. Is the "Latrine," with a self-acting flushing cistern, to be recommended, especially where water is not very plentiful? I have just looked over a number of copies of the BUILDING NEWS for an advertisement referring to "Latrines," but cannot find it, although I know it used to appear there. I am now specially making inquiry on behalf of a mixed school with about 100 children therein.—A 29½ YEARS' SUBSCRIBER.

[10091.]—**Measuring Buildings.**—Will "H. L.," or some other subscriber, kindly tell me where I can obtain a good modern work on the system adopted in London by surveyors for measuring up buildings to check contractor's bill? ESPERE.

[10092.]—**Cement.**—I have a rain-water cistern, put in a few years ago, which was badly cemented in Portland cement, and as it leaked, I had the cement hacked off, and re-cemented with Roman about six months ago. Since this has been done the water is very hard. I shall be glad if anyone can explain the cause and suggest a remedy.—R.L.

REPLIES.

[10062.]—**Destructors.**—I think no information has been given in reply to query No. 10062 as to Destructor for Rubbish, and the following particulars of two furnaces which have been constructed for that purpose, and have been in successful working for several years, may be found useful. The height of chimney is 50ft., with a flue 2ft. 3in. diameter; the furnace bar area is 6ft. long and 4ft. wide, and 2ft. 6in. high to crown of arch, and 2ft. 6in. from bar-level to floor of ash-hole; the flue from furnace to chimney is 3ft. wide, reduced to 18in. at chimney end, the bridge at back of furnace reducing it to 12in. high at that point. The whole of the sides and bottom of furnace and flues are lined with 4½in. of firebrick, backed by 9in. of common bricks. The furnace arch is in two 4½in. firebrick rings springing from continuous iron skewbacks, and the whole is bound together by 1¼in. rods top and bottom, secured to perpendicular cast-iron flanged plates—four on each side; firebrick continues 15ft. up chimney. If "J. B." desires any further information, I will endeavour to furnish it direct. I may add that a furnace such as this is estimated to consume about eight tons per diem; but very much depends on whether the rubbish is wet or dry.—J. A. B.

Great inconvenience having been felt by the inadequate vestry accommodation of St. Thomas's Church, Seaforth, a movement was organised by the vicar, the Rev. R. F. G. Smithwick, which has resulted in the buildings which have just been completed. The extension almost doubles the accommodation for the choir, and provides a parochial room which can be used for Bible classes and all purposes connected with the parish. This room is approached from a new porch, which also gives access to the church through the old vestry; this vestry will now be used merely as a vestibule. The building is of brick, covered with Ruabon brindled tiles from Messrs. Monk and Newell's works; the windows are filled with lead glazing by Mr. Rowlands, of Liverpool; and the floor is covered by wood blocks. Mr. George Johnston, of Seaforth, is the general contractor, and the work has been carried out from the designs and under the superintendence of Mr. J. A. Berrington, A.R.I.B.A.

St. Joseph's Industrial School for Roman Catholic boys, situated a mile from the village of Tranent, N.B., was formally opened on Friday. The building, which, under the scheme of the Education Endowments Commissioners, ceased to be known as Stiell's Hospital, was purchased about 12 months ago by Archbishop Smith for less than £700, and has since been adapted for its present purpose. On the ground floor are now a large plunge-bath and lavatory, dining-rooms for boys and officials, scullery, kitchen, and laundry; on the first floor a school-chapel, and also the officials' sleeping-rooms, and on the second floor dormitories, with accommodation for fifty boys. Exteriorly the structure maintains its old appearance. Mr. Archibald MacPherson, 37, George-street, Edinburgh, was the architect; and the total cost of the purchase and equipment has been over £3,500. The grounds cover 12 acres.

Improvements are being made to the entrance to the new Council Chamber at the City Guildhall by the removal of the hall-keeper's office, and the provision of a flight of steps leading direct into the chamber. The works are being carried out under the direction of Mr. Alexander Peebles, the City Architect, by Mr. J. T. Chappell, of Lupus-street, Pimlico, whose tender was accepted at £2,146.

A new Odd Fellows Hall was opened on the 12th inst. in the village of Lacock, near Chippenham. The hall, which is capable of holding 300 people, is built from the designs of Mr. J. A. Randell, M.S.A., architect, of Devizes, Mr. F. Banks, of Lacock being the builder.

LEGAL INTELLIGENCE.

RE J. E. HARLEY.—Under a receiving order made on the 12th July in the case of John Edwin Harley, of King William-street, City, architect and surveyor, accounts have now been furnished showing gross liabilities £29,207, of which £18,454 are fully secured, and £7,581 expected to rank, the assets being of the nominal value of £10,160. The debtor states that he commenced business in London in 1874 without capital, and had since, in addition to his ordinary business, been engaged in speculative operations in property in the City, to which his liabilities for the most part relate. A meeting of creditors was held on Tuesday, at which an offer of £200 was made on behalf of the debtor in satisfaction of the liabilities, his solicitor asserting that, although the debtor entertained very sanguine ideas as to the value of his properties, there would be nothing for the creditors if the matter went into bankruptcy. The offer was rejected, and the proceedings resulted in bankruptcy.

KIRKCALDY WATER COMMISSIONERS AND THE CONTRACTORS FOR THE NEW WATERWORKS.—At a meeting of the Water Commission for Kirkcaldy, the secretary submitted copy of petition presented to the House of Lords by Messrs. John Ross and Sons, contractors for the new waterworks, withdrawing their appeal against the Commissioners, they paying the respondents' costs as taxed. The appeal arose out of the Court of Session sustaining the decision of Mr. Leslie, C.E., as arbiter, Messrs. Ross and Sons objecting to Mr. Leslie on the ground that he was one of the consulting engineers of the Water Commissioners. With reference to the dispute between Messrs. Ross and Sons and Mr. Sang, C.E., as to the amount still due to the firm, who claimed £1,300, a committee was appointed to meet Messrs. Ross and Sons and Mr. Sang, with a view of arriving at an amicable settlement. Mr. Sang stated that the completion of the works was thirteen months beyond the time contracted for, which, at the rate of £100 per month, rendered the contractors liable to the Commissioners for £1,300.

CHIPS.

Alterations have been made to the Royal Military Academy, Woolwich, embracing the ventilation, the extraction of the vitiated air now being effected by the latest improved form of Messrs. Robert Boyle and Son's patent self-acting air-pump ventilator.

Messrs. Lockerbie and Wilkinson, Birmingham, have just completed the ornamental wrought-iron entrance gates and railing, also the gates for chapels of new cemetery, Grimsby, to the designs of Mr. E. W. Farebrother, architect. This firm have just issued a sheet of wrought-iron gas-fittings, which are low in price, considering the artistic designs. We would advise architects to get a copy.

Dr. J. C. Thresh, of Manchester, who recently published an exhaustive study of the sanitary condition of Ancoats district, in that city, has been appointed Medical Officer of Health for the combined sanitary districts of Chelmsford and Maldon, at a salary of £600 per annum.

The ceramic gallery of the British Museum has been enriched by the addition of a majolica vase, well known by connoisseurs as one of the gems of the Stowe collection, the gift of Mr. R. M. Philips. The vase was No. 483 in the Stowe catalogue, and is engraved (Fig. 34) and described in Marryat's "History of Pottery." Mr. Franks has placed the vase beside examples of majolica painted by Girolamo di Lanfranco, finding in the execution affinities to the work of that master.

A new Roman Catholic Church is shortly to be erected in Tyndall-street, Cardiff, from plans prepared by Mr. Charles C. Jones, M.S.A., architect, 44, Charles-street, Cardiff. The church will be built to accommodate from 600 to 650 persons.

The directors and shareholders of the Airdrie and Coatbridge Water Company have resolved to apply to Parliament for powers to obtain an additional supply of water for the district, at an estimated cost of £80,000.

On Sunday the Bishop of Liverpool (Dr. O'Reilly) was present at St. Mary's Roman Catholic Church, Duke-street, Barrow, on the occasion of the inauguration of a new spire. The church was erected about 25 years ago, and a site was left for a tower and spire when the necessary funds could be provided to carry out this work. The new spire is built of white Cheshire sandstone, and is 170ft. high.

The equestrian statue, similar to that erected at Glasgow, presented by the women and girls of the United Kingdom, which is to be placed on Smith's Lawn, near Cumberland Lodge, Windsor Great Park, and is being executed by Sir E lgar Boehm, is nearly completed. It will be finished by the time the Queen returns from Scotland to Windsor Castle, when it is her Majesty's intention to unveil it.

Our Office Table.

THE list of awards to British architects exhibiting designs in the Paris Exhibition is chiefly significant in its omissions. Diplomas of honour are taken by Mr. Norman Shaw, R.N., and Mr. Thomas Edward Collcutt. First-class medals have been awarded to Messrs. Aston Webb and Ingress Bell, and Messrs. Douglas and Fordham, of Chester. Medals of the second class have been taken by Dr. Rowand Anderson, Edinburgh; Messrs. Goddard and Paget, Leicester; W. Emerson, Leonard Stokes, London; and William Young, of London and Glasgow. Third-class medals have been awarded to Messrs. William White, F.S.A.; G. H. Birch; Burnett, Son, and Campbell, of Glasgow; Campbell, Douglas, and Sellars, of Glasgow; and John O. Scott.

WE have frequently called attention to the fact that many local authorities are ignorant as to the powers they possess of making by-laws which would enable them to effectively check jerry building and insanitary arrangements. Often, indeed, officials and members of town councils and urban boards lament that they would have to obtain legislative powers to deal with difficulties which could be readily coped with by a code of by-laws. An instance in point comes to hand from Bristol. In April last the corporation of that city passed a resolution authorising the promotion of a Bill in Parliament for regulating the materials used in buildings, and the erection of houses on areas liable to be flooded. It was recently pointed out, however, that the model by-laws of the Local Government Board would, with slight modification, meet all the requirements of the Bristol Corporation, and, at the meeting of that body on Tuesday, it was decided to rescind the resolution for seeking legislative powers, and to relegate the subject to a committee, with instructions to frame the desired by-laws, and report back.

AT the last meeting of the Board of Guardians for Great Preston, near Worthing, a letter was received from Messrs. Peachey and Brown, of Worthing, whose contract for the erection of the additional Infirmary buildings about to be built, from plans by Mr. Howard, was accepted at the last sitting of the Board, stating that owing to the Dock Strike the price of the timber required for the work had advanced by the sum of £29 10s., and they desired to defer the naming of the sureties required until such time as the Board had decided whether they would agree to the amended tender of £729 10s. Mr. W. M. Smith, builder and member of the Board, explained that the prices of iron work and timber were going up very fast, and were much higher than when tenders were submitted. The Clerk stated that sureties were not required in the specifications. Out of eleven tenders sent in Messrs. Peachey and Brown's was the lowest, the next being from Snewin Brothers, Littlehampton, £794, and the highest from Langley and Co., Crawley, £995. Mr. Smith said they asked the contractors to do something they had not bargained for, and he moved that the amended tender be accepted, as it would then be lowest by over £60; but a majority of the Board decided that unless satisfactory sureties be named by Messrs. Peachey and Brown within a week, fresh tenders be advertised for.

THE discussion on "Monumental Brasses" is being continued in the columns of the *Standard*, and many instances are quoted by correspondents of brasses that have disappeared during or since restorations, or have been stolen, owing to the negligence of clergymen to see that they are properly secured to the stone matrices. Mr. T. J. Gawthorp, of Long-acre, W.C., offers some valuable suggestions as to the preservation of brasses. He says:—"In numerous ancient brasses the ancient rivets are so insecurely attached to the metal that they are, in most cases, left in the stone; and as many of the ancient brasses were in several pieces, it will be readily seen how it is that so many are imperfect, or entirely lost. In all cases of broken brasses the pieces should be securely riveted on to one plate, and, by means of strong rivets and lugs, firmly attached to the wall near the original tomb or stone. As to 'restoration,' this may be, and is done, in such a manner as to truly preserve the memorial in its ancient state (e.g., those at St. George's, Windsor, and at Croydon); and not only this, but new pieces may be inserted in 'latten' brass, still keeping up the ancient character, as may be seen in the inscription verge of the tomb of Chief Justice Gascoigne, at Harewood (originally known as Gawthorpe)."

THE syllabus of lectures for the ensuing session of the Engineering Department, at the City of London College, under Professor Henry Adams, M.Inst.C.E., M.S.A., includes a course on technical drawing construction, and others on building construction, machine construction, civil engineering, mechanical engineering, land surveying, and quantity surveying. On the latter subject there are two courses of ten lectures each, the first, for which Mr. Banister Fletcher's work is the textbook, being designed to enable the student to take off quantities and bill them in accordance with the ordinary London practice; the second course is more advanced, and aims at preparing students for the Surveyors' Institution examination in quantities; Mr. John Leaning's "Quantities" is the textbook. The subject of the architectural competition for the session is a cottage hospital of ten beds. The fees in the classes are very moderate, so as to enable artisans to avail themselves of the advantages of the College, and numerous scholarships and prizes are offered in the various classes.

CHIPS.

The new German Theatre at Vienna was inaugurated on Saturday evening. It is entirely isolated from other buildings in a little garden, is built of white stone, and is lighted by electricity. Messrs. Felmer and Helmer, of Vienna, were the architects.

Northwich was *en fête* on Saturday in celebration of the unveiling of the bronze statue of the late Mr. Robert Verdin, which has been erected by public subscription in the Verdin Park, which was given by him, as well as the Victoria Infirmary and Public Baths, situated within its boundary, to the people of Northwich. Mr. Verdin was M.P. for Northwich division, 1885-87. The statue is the work of Mr. Joseph Swynnerton, of London, and cost £750, and with the granite pedestal (executed by Messrs. Patteson, of Oxford-street, Manchester) £1,096.

In the list of dividends in bankruptcy in Tuesday's *Gazette*, the announcement appears of "Paull, Henry John, Burghley-road, Kentish Town, and carrying on business with A. A. Bonella, of Quality-court, architect—supplementary div. of 5s. 7d."

In adopting a report recommending remedies for the prevention of the great floods which did damage estimated at £100,000 last March, the Bristol town council resolved on Tuesday to apply to Parliament for power to carry out a scheme, involving the expenditure of £200,000. This will be chiefly spent on the river Froom, which is to be tapped at Stapleton by a tunnel culvert, to be bored beneath Durdham Down, in order to conduct the surplus water at times of flood to the river Avon.

On Saturday evening, to commemorate the completion of the work of restoration at Christ Church, Pill, Somersetshire, the vicar invited the builder, Mr. W. Maggs, of Lodway, and workmen to a supper at the Anchor Inn, Ham Green.

Another monument has been unveiled in Paris. The latest memorial is in honour of the National Defence. It is a pyramid in Vire granite, standing on a hexagonal pedestal, the whole being about the height of four stories of a Parisian house. The site is the Place de Fontenoy, near the Hôtel des Invalides.

The school built at Penkridge, Staffs, as a memorial to the late Lord Hatherton, C.B., was opened on Monday. It accommodates 450 children, and occupies the site of an older school; the materials are red brick and stone for dressings. Mr. J. A. Chatwin, of Birmingham, was the architect, and Mr. A. Gilbert the builder.

A large clock has been erected in St. John's Church, Coventry, striking the hours and quarters, and showing time upon three skeleton iron dials, 7ft. 9in. in diameter. Special care has been shown in erecting the dials not to spoil any architectural features of the tower. Messrs. J. B. Joyce and Co., Whitchurch, Salop, are the makers.

Two more busts of distinguished Scotsmen were yesterday (Thursday) placed, with befitting ceremonial, in the hall of heroes within the Wallace Moument at Stirling. The first is a bust of Adam Smith. The sculptor is Mr. D. W. Stevenson, R.S.A., who has modelled the face from the Tassie medallion. The other bust is that of Tannahill, the poet, and is also by Mr. Stevenson.

The will of the late Charles Sacre, C.E., for many years chief engineer to the Manchester, Sheffield, and Lincolnshire Railway Company, has just been proved, the net personalty amounting to £165,382.



ENTRANCE FRONT

"FANSHAWS"·HERT

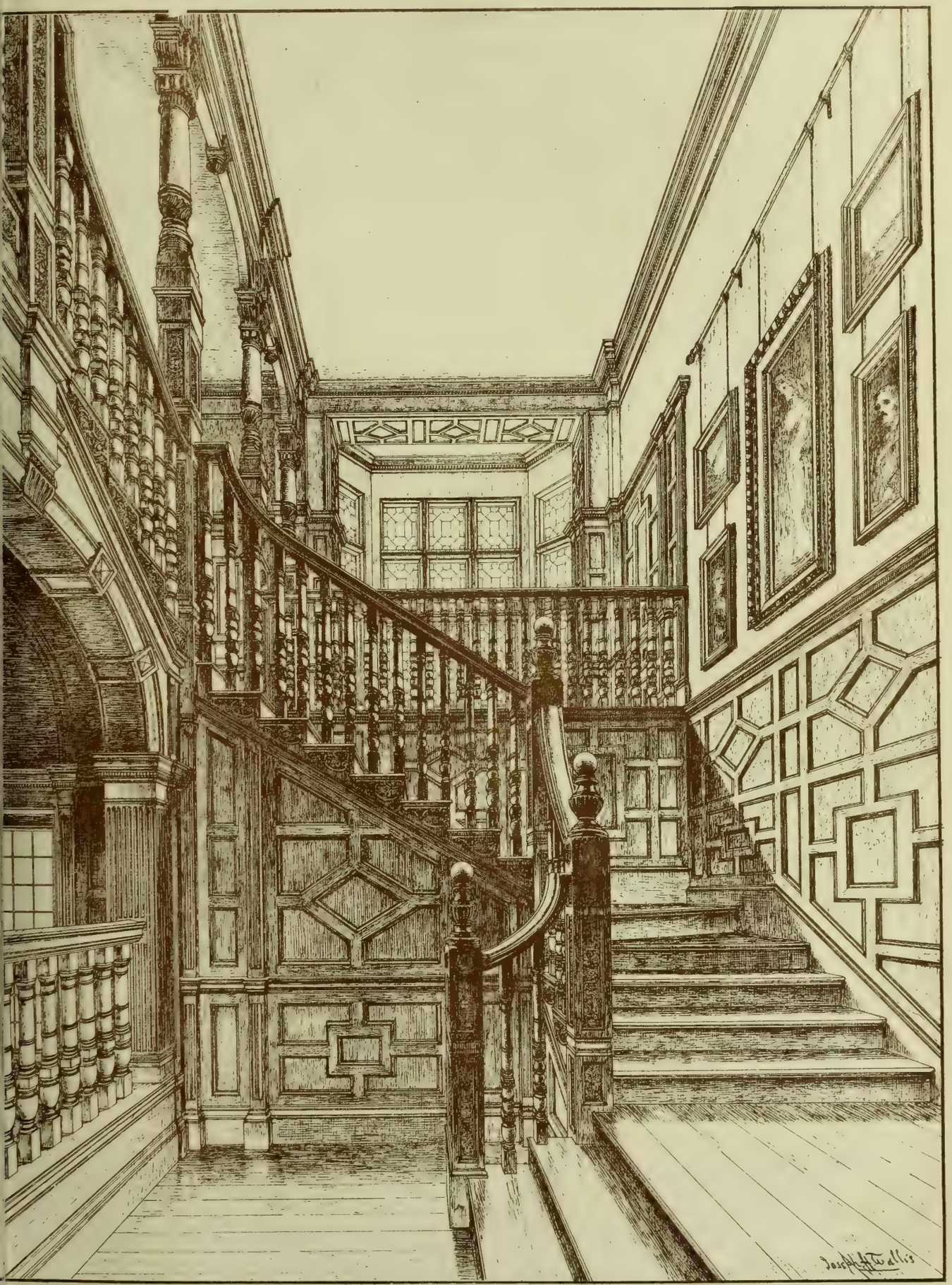


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PRINCIPAL · STAIRCASE

· · JAMESON & WALLIS · ARCHTS

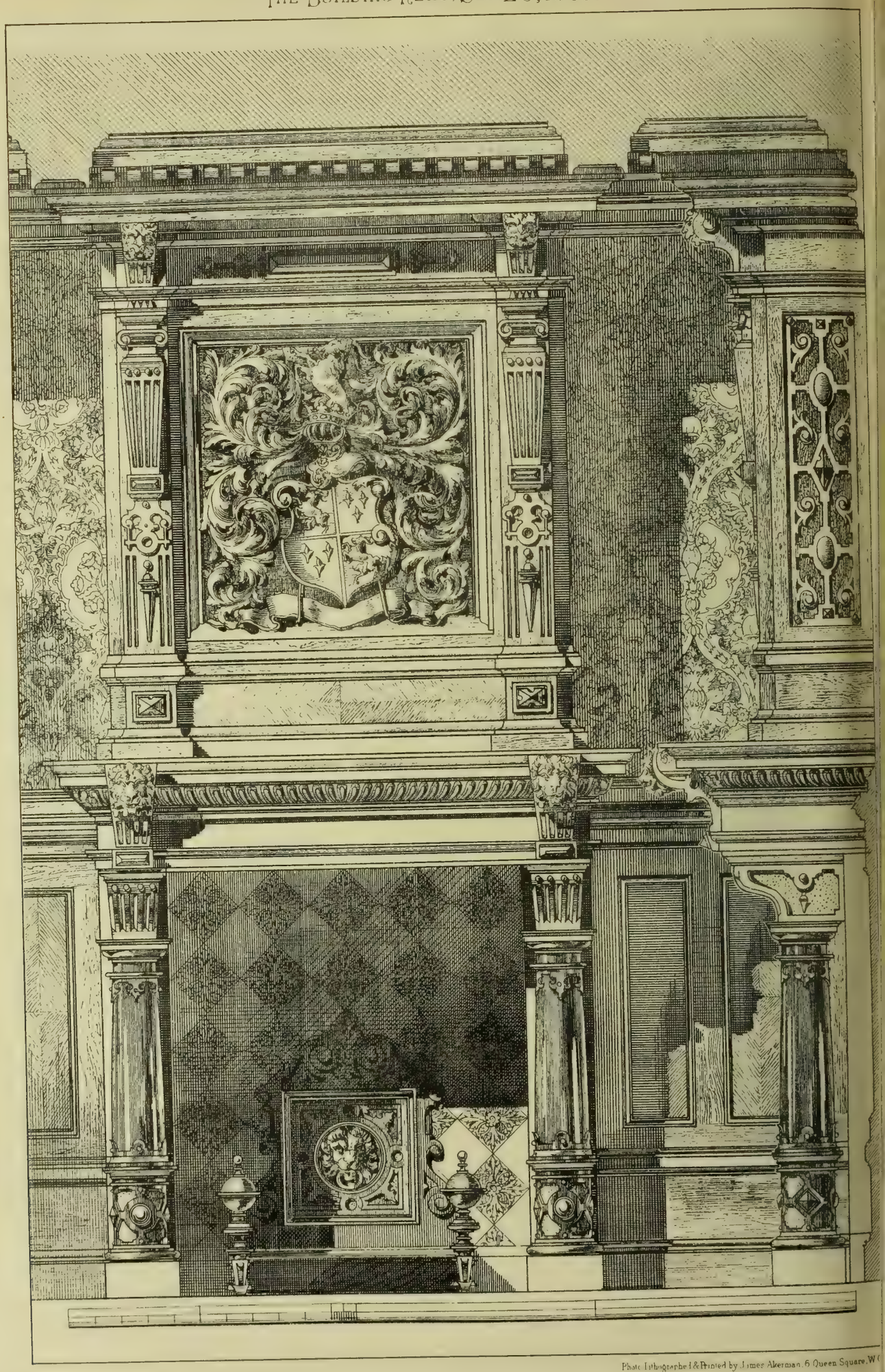


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CHIMNEY PIECE, VILLA CARSTANJEN, GODESBERG ON THE RHINE.

KAYSER & VON GROOZHEIM, ARCHITECTS.

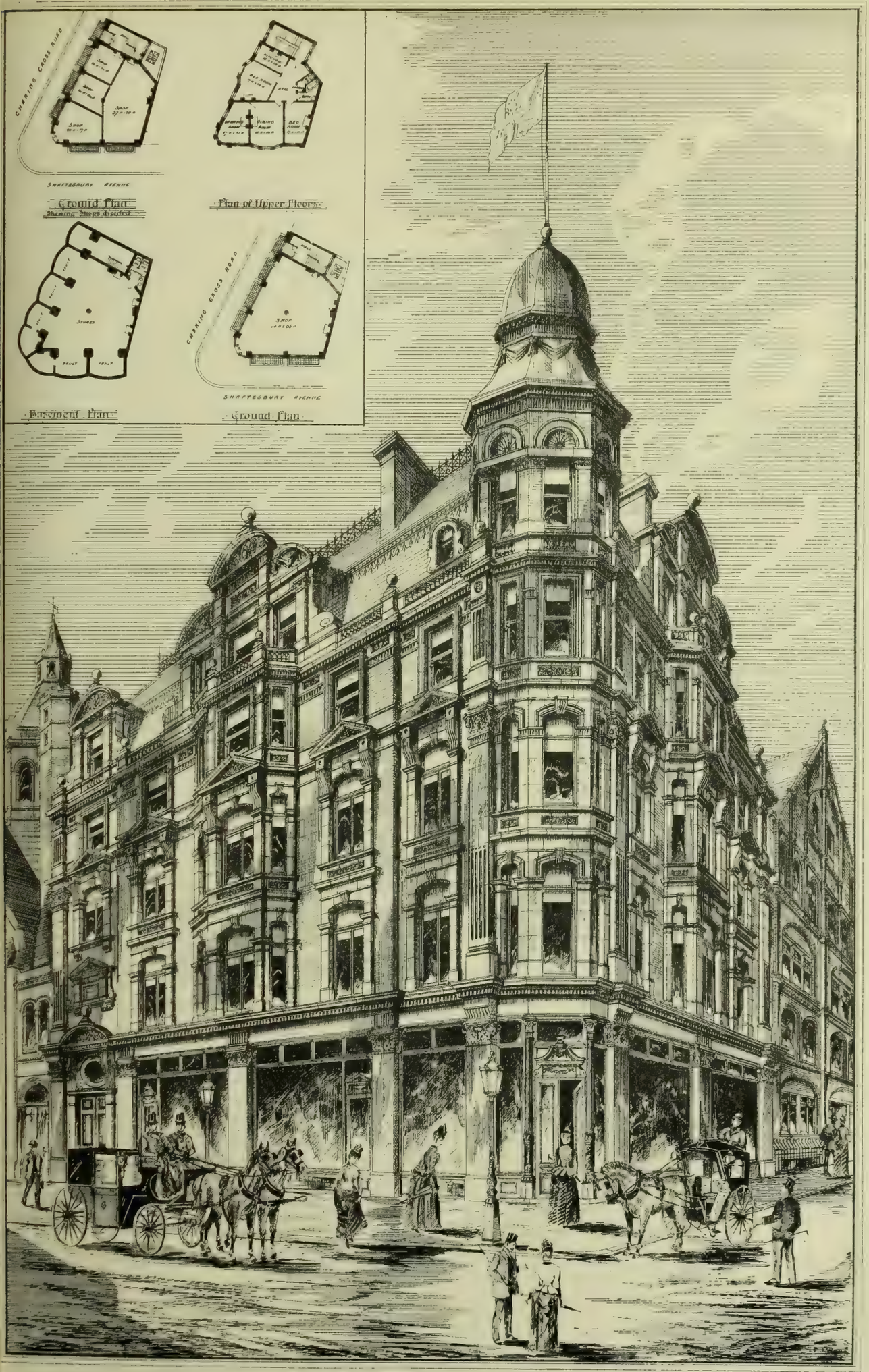
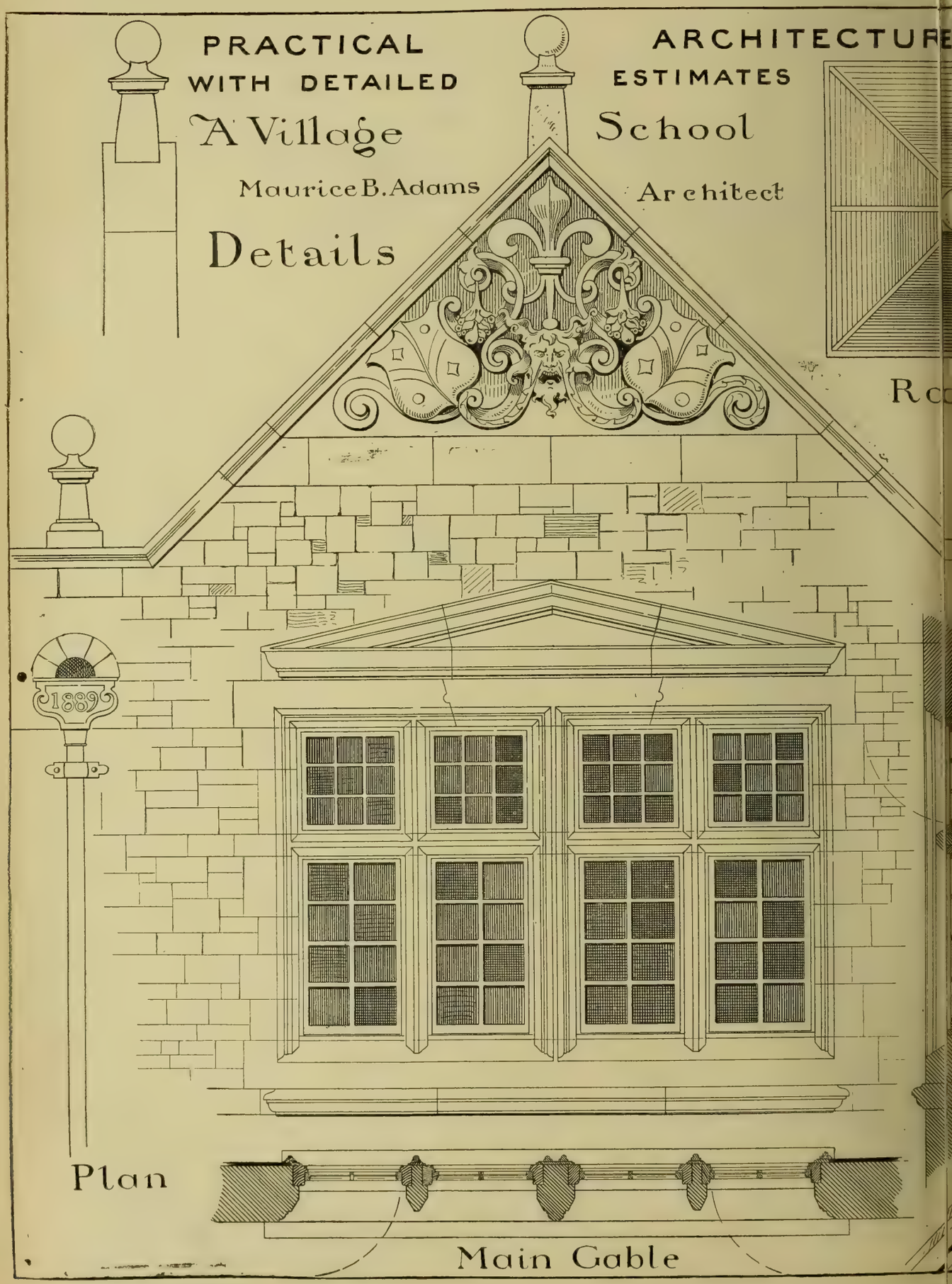
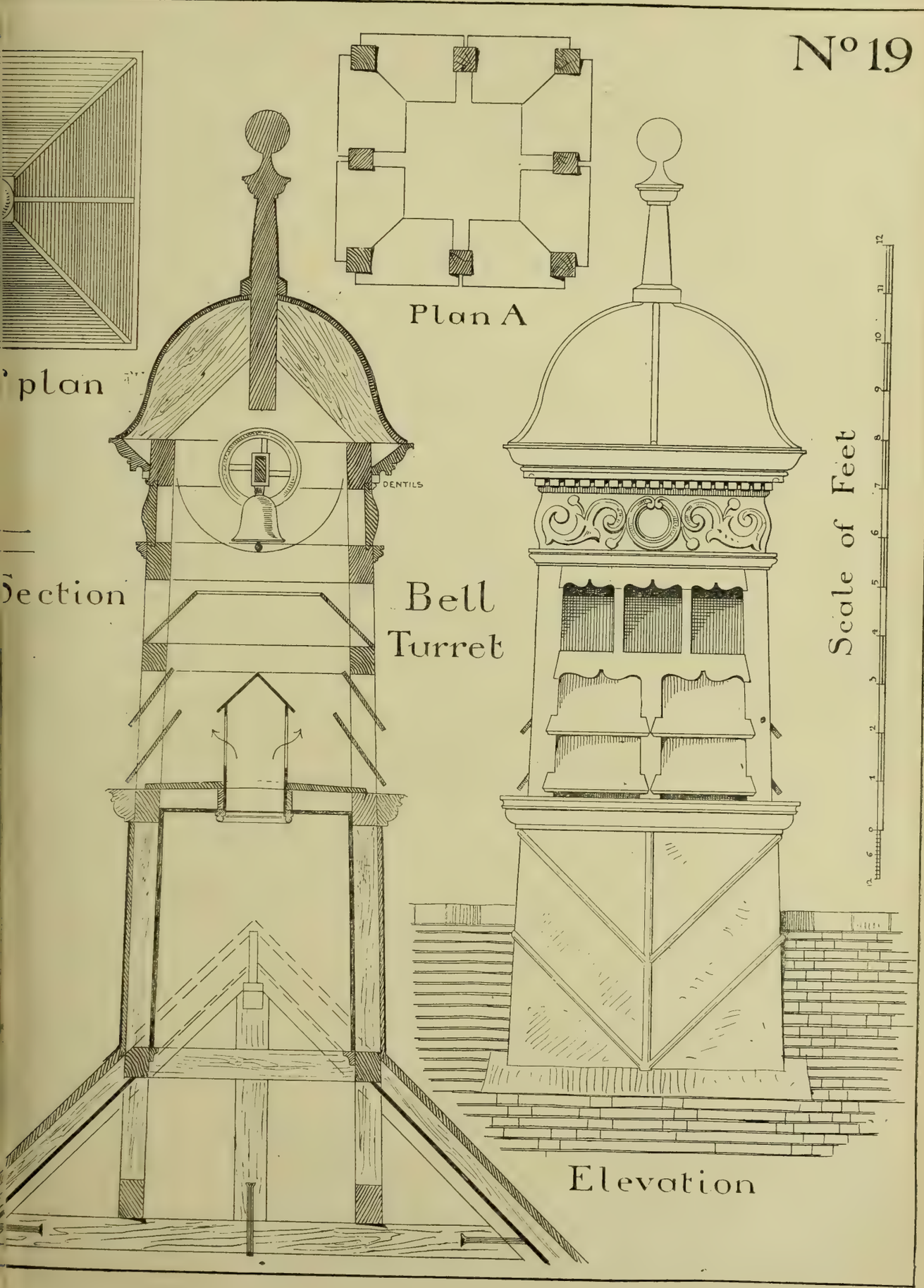


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ALBANY MANSION, SHAFTESBURY AVENUE. W.

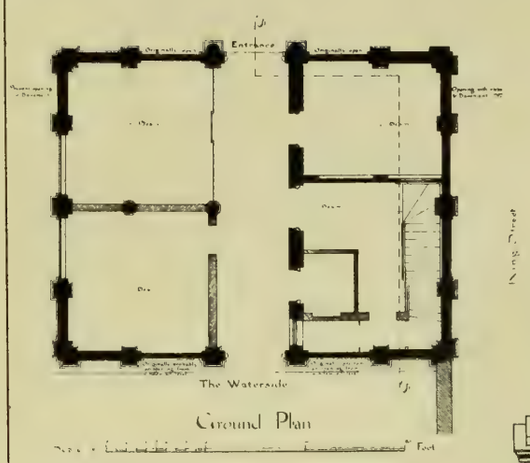
MESSRS MARTIN & PURCHASE, ARCHTS


PRACTICAL ARCHITECTURE
WITH DETAILED ESTIMATES
A Village School
Maurice B. Adams Architect
Details
1889
Plan
Main Gable


N°19
Plan A
plan
Section
DENTILS
Bell
Turret
Scale of Feet
Elevation

THE CUSTOM HOUSE

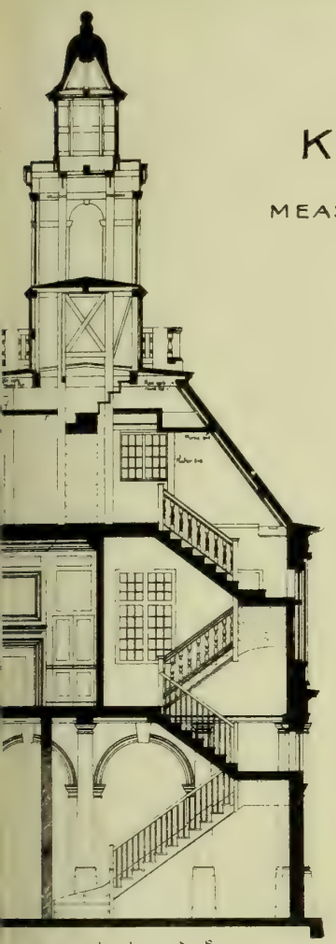
BUILT 1683



North Elevation.

KING'S LYNN

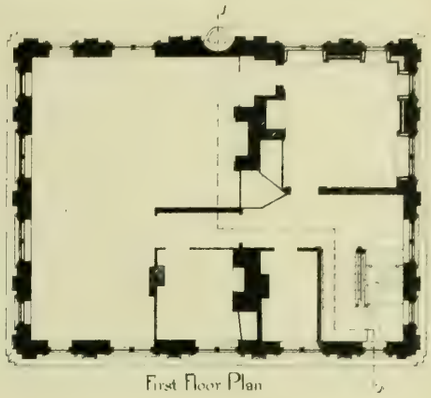
MEASURED AND DRAWN BY
CHARLES OURY KING



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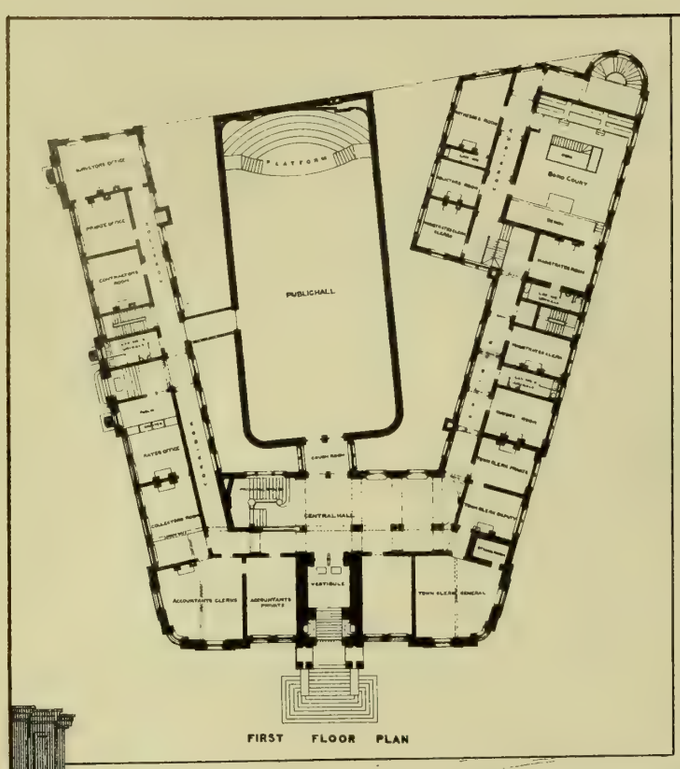
old guide book and
of the town of Lynn.



First Floor Plan

West Elevation.

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FIRST FLOOR PLAN

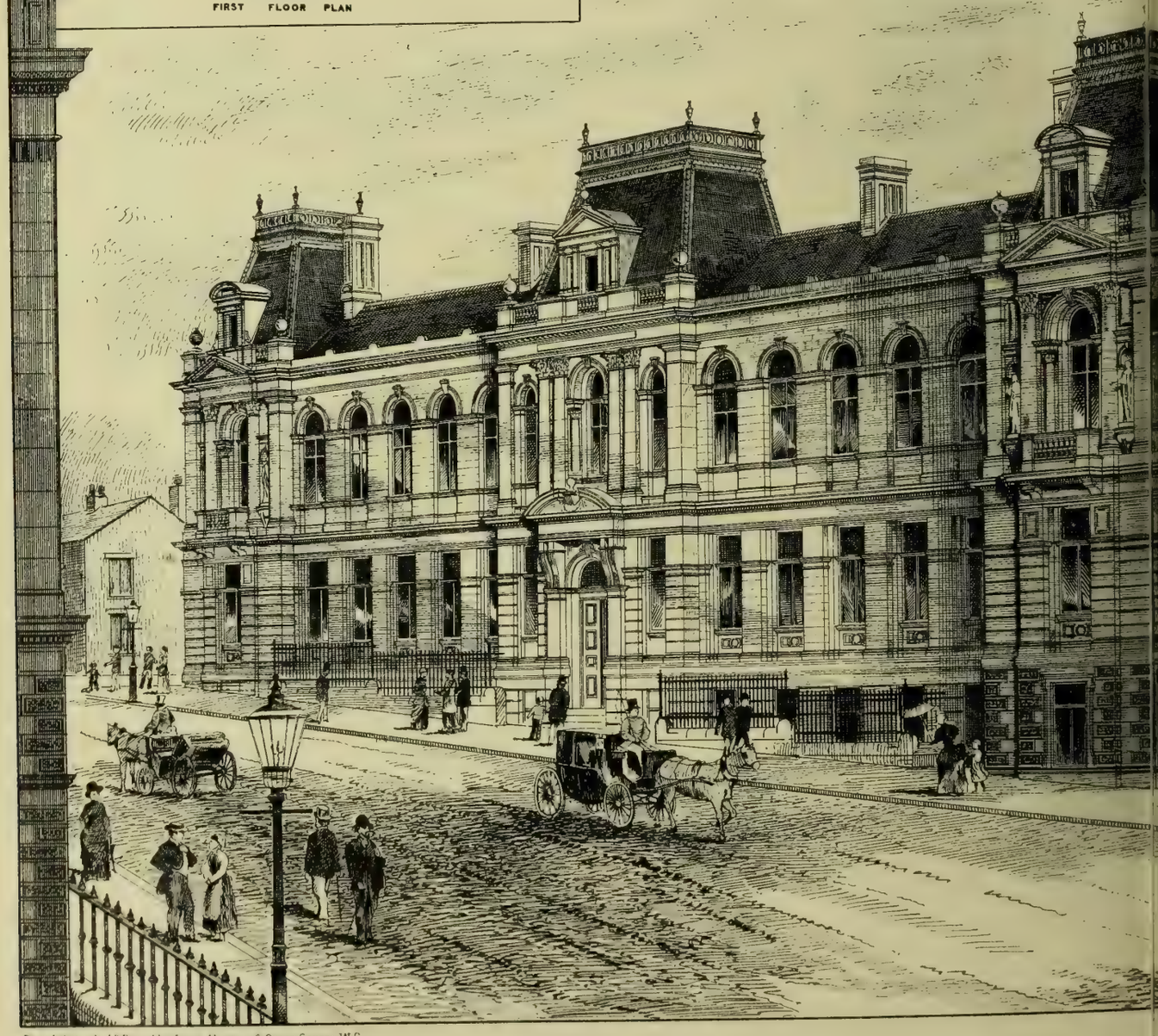
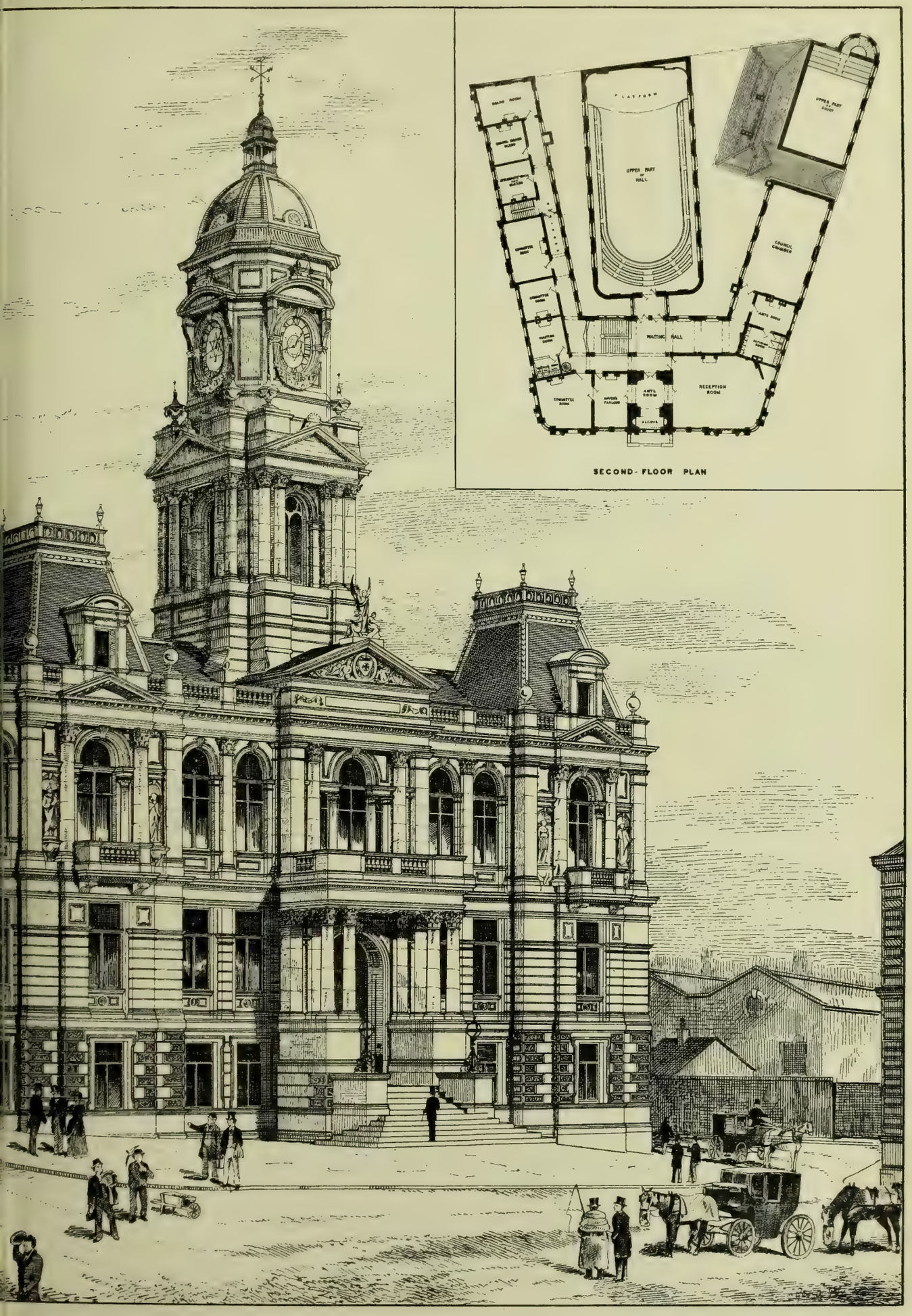


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DEWSBURY TOWN HALL



SECOND-FLOOR PLAN

& MUNICIPAL OFFICES

HOLTOM & FOX ARCHITECTS

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1812.
FRIDAY, SEPTEMBER 27, 1889.

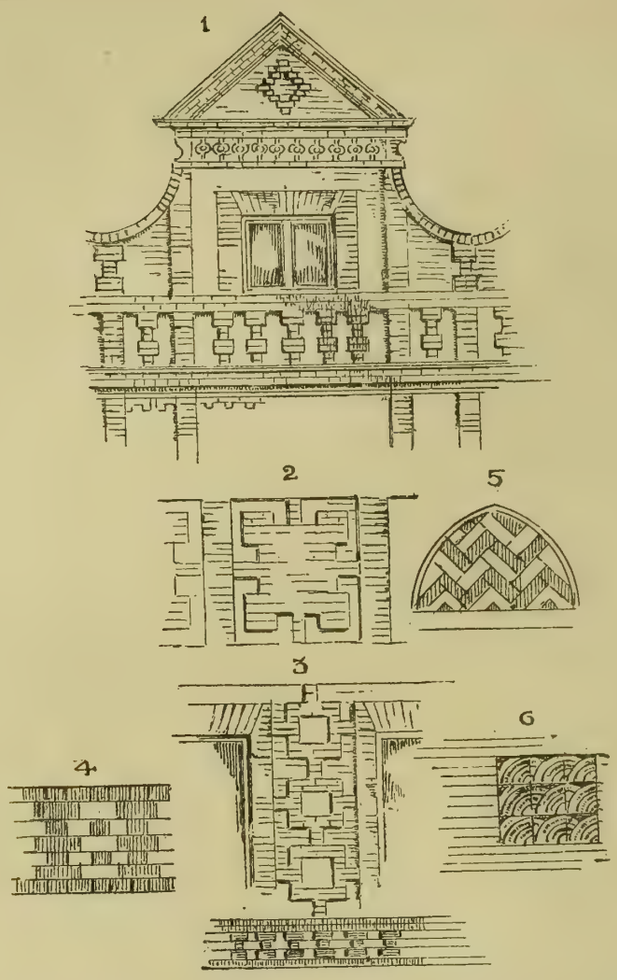
ARCHITECTS AS AGENTS.

TO facilitate business, and as a more convenient form of undertaking the duties of the architect, there are many who accept commissions, and then contract with artists and tradesmen to carry out the work. In this manner the duties and responsibilities of the architect are, if not legally, practically shifted to another party, who undertakes to carry out the intentions of the architect upon his own responsibility. We have no intention here of expatiating on the advantages this sort of "sub-contracting"—to use a phrase that applies more correctly to the work of the builder than to the architect—offers to one who is ready to carry on his profession on an expeditious and commercial principle. The architect's labour is minimised, the details at least of the design are furnished, and his deputy has nothing more to do than to perform his work in a business and perfunctory manner, quite regardless of high scruples or the nicer dictates of conscience. He submits a design or specification to his employer for carrying out the work at a given amount, offering to do anything to meet his approbation or approval. The contract is sealed between the parties, virtually the architect and tradesman, nominally the employer and tradesman. The difference between this and the usual and proper form of contract is that the architect and contractor are virtually one; their interests are almost the same, for the architect accepts the design and workmanship of the contractor, instead of preparing his own design and specification, and in this capacity he takes the place of a middleman, acting merely as the agent between employer and workman. It may be argued that in a large number of cases, the "employer, architect, and contractor" arrangement, in which the architect acts as independent artist and mediator, is practically the same as the above-mentioned transaction, inasmuch as the busy practitioner has little time to examine the work, and to exact the terms of his own specification; that practically the contractor does very much as he likes. No doubt he can. Very often, although bound by contract to conform and comply with the architect's design and instructions, he uses his own discretion, and the building is really very little better than what the contractor cares to make it for the sum at his disposal. Not only may we acknowledge the force of this assumption; but we have practical evidence that in several instances the architect's intervention has been of very little account in the total result, and it is necessary to point out under what circumstances the agent-architect may act as efficiently as the individual who prepares a design and specification for a work which undergoes various modifications in its execution. First, we may bring to the reader's notice a class of architectural work which can be more skilfully and efficiently accomplished by the specialist who has devoted his whole life's study to the subject. Let us, for example, take the work of the art decorator. Scarcely one out of ten architects have made the question of decoration and colour a subject of study—not a very flattering admission to make as to a profession which ought to include the subject of decoration as a special branch. So it is, however. The practical requirements of building and surveying have been the all-absorbing questions, leaving very little opportunity, and often, we regret to say, very little inclination for art attainments. Probably it is no libel on the practical architect to say that he is quite unqualified to suggest a scheme of decoration for a house he may have designed and carried out, certainly incompetent to prepare a design for the decoration of a church or public hall. What should a man versed in construction, building materials, and measurements understand about primaries and complementaries, harmonies and contrasts? Keys, tones, and shades are almost mysteries to him. In this department of the profession therefore the experienced decorator has more skill, and presumably more taste, than the ordinary architect, and is consequently more fitted to design a scheme of colour-decoration and specify for its proper execution. If the architect interferes, he may do injury. At the present moment we know of at least two public undertakings of a decorative character that have been placed in the hands of one of our leading firms of decorators, and who are associated in name more than in reality with well-known architects in the conduct of the work. In these cases the architects of the respective buildings have advised generally, their names being a guarantee of the design and efficient execution, though the whole scheme has been practically left in the hands of the firm of decorators. The general scheme has been submitted to, and approved by, the architects whose names are connected with the work; but the details and selection of the style of ornament and selection of colours have been left to the artists, and the results in both cases are eminently successful.

In artistic ceramic work the ordinary practitioner would do well to obtain some technical advice before he prepares a design, and here also the specialist is better able to advise and to write the specification. In stained and painted glass work the taste and skill of the glass-painter, the knowledge of ecclesiastical symbolism and of the glass work of the Middle Ages, are necessary to the preparation of a design for a series of figure subjects for a church. Few architects would consider themselves competent to prepare such designs or equal to the task of instructing the artists, and this class of design is left to the taste and advice of some well-known artist and manufacturer. Ecclesiastical woodwork is another class of art design which the ordinary architect understands very little about. May he not, therefore, be doing both justice to himself and client if he obtains other advice, and places his rough ideas in the hands of the ecclesiastical furnisher? The worker in brass and iron must know more about the technical points of his trade than the architect is expected to do. Now in all these cases the expert is naturally more skilful, and must be expected to know more about the points of good design than the architect himself. Yet custom has placed all these special artists under the control of one individual, whose designs and instructions they are supposed to carry out. Practically, as we have shown, these experts have their own way. Indeed, the manufacturer, in the plenitude of his power, is apt to ask why it is the employer is so short-sighted as to have engaged a person to design and prepare specifications for work about which he knows nothing, which he could have carried out equally as well, if not better, single-handed. One often hears these remarks, and the answer to them is briefly that the executant is not always the most capable of advising on the general design; that the architect, by his general knowledge of the building and his client, is more capable of ordering the work, leaving the details to those who are intrusted with the execution. On the other side of the question, there is, we admit, a danger in thus placing oneself unreservedly in the hands of the contracting firm. The decorator may prove arbitrary and dictatorial, and make it very difficult for the architect to assume authority over a matter which he has delegated to another. The architect perhaps has left everything to the judgment of his colleague, and has no power to interfere. Designs and specifications have been prepared by the contractor, who undertakes to carry them out for a certain sum. The terms of the agreement are here important, and ought to be framed in such a manner as to give the architect the power of making any slight modifications that may be suggested. The approval of the scheme of decoration is even more essential; the architect should take the trouble to satisfy himself of the soundness of the proposals offered to him, and even consult a competent person if his own taste is not to be relied on. If possible, the architect should give a rough design of the scheme, and make it the basis of the drawings or cartoons submitted to him by the artist. An able and respectable firm should always be engaged, more especially if the work is to be left entirely to them. The difficulties and want of agreement between the contractor and the employer arise mainly from the want of arranging the preliminaries. In the early drawings of a building that is intended for decoration, attention ought to be given to the subject; and an early consultation with the artist to be employed, before the details are finally agreed to, would save many awkward misunderstandings.

The design of constructional ironwork is a matter about which the architect knows very little as a rule. We will suppose that the architect is preparing a design for a corn exchange or market, over which an iron roof or domical centre lantern is intended. Is he justified in conferring with an expert or engineer before he completes his design, or should he finish his plans and submit them to the engineer to prepare the necessary details for the ironwork? The answer will be a matter of individual competence. The properly qualified architect ought to be able to complete his general design in all essential points, and then consult the engineer about the details, the sizes of members to bear certain strains, and the details of putting together. It would be wiser for the younger and inexperienced architect to obtain the advice of the engineer before the plans and sections are finally inked-in, to allow any suggestions to be made. The detail drawings may be left entirely to the engineer to prepare with his specification and estimate; or the architect may ask an engineering firm to make a design and estimate for the work complete, in which case the architect simply acts as an agent for his employer, but cannot be credited with the design, so there are degrees in which the special work is delegated. It is well known that the late Sir Gilbert Scott obtained the advice and assistance of an eminent engineer in the design of the great pointed ribbed roof over the Midland Railway terminus in the Euston-road, and also in the strengthening of the spire of Salisbury Cathedral, works which reflect credit on both architect and engineer, combining as they do the results of the highest architectural taste and constructive skill.

These arguments only prove that the architect's work must, as a matter of necessity, be made up of his own skill and taste, and the knowledge and experience of others; that in many instances he has to act in the capacity of an agent, employing and arranging the highest technical craftsmanship he can command; in other instances, as an architect proper, designing and directing the labour of others. It should be his earnest wish to assume the latter *rôle* more completely by mastering details, and extending the artistic functions of his profession; and in these cases, where he is obliged to call in the advice of the specialist, he may do so with discriminating intelligence. We wish we could see more of this spirit of independent thought and con-



scientious labour manifested amongst the ranks of the profession. Unfortunately, there is a strong inclination to shirk work and responsibility when any unusual skill is necessary, and a growing desire among the firms of contractors to take advantage of this spirit by offering their services in the design of buildings, fittings, and decorations with which they may be intrusted as contractors.

ARCHITECTURAL BRICKWORK.—XIX.

WALL ORNAMENTATION.

IN the surface ornamentation of gables many methods of using bricks of varied colour and the arrangement of bond are open to the architect. Thus, in gable work filling, the bricks can be laid as all headers, and every other brick in each row be made to project about an inch. The effect is to produce a pleasing diaper of broken light and shade. By using English bond, one course of headers and one course of stretchers, several arrangements of pattern can be produced by having black headers. Thus, for example, a black header every fourth brick, and a black stretcher every other course, in five consecutive courses, will give an upright baluster pattern between bands of dark brick. We illustrate a pattern of this kind in Flemish bond (Fig. 4), in which every other brick, in both the stretcher and header courses, is a dark one. Our first sketch is a gable treatment of a row of houses in which variety is sought by a combination of horizontal, vertical, and oblique lines in grey and red bricks. Below the windows a band of the baluster pattern occurs. The upright quoins between the gables and the pilasters are made to project a little and form useful lines to separate the houses. A pediment crowns the gable, the projecting members of which serve to throw off the rain and keep the flatter members dry. The vertical quoins between houses serve to mark the width when they are all in one line, and might be more often used than they are in rows of brick houses in streets; but whether or not for the purpose of deceiving the eye, and of making the frontage of each house appear wider, we cannot say; but whole rows of brick frontage are found without any separation whatever, making the street appear lower and more monotonous than it otherwise would. Various forms of brick panels can be made to give relief to spaces between windows. Sketch 2 shows a raised panel forming one of a series under a row of windows. No cutting or rubbing is required, as the pattern of panel is entirely formed out of plain bricks; the protruding corners of raised panel are one brick wide and four in depth, and each set-off is two courses, or half a brick. The sunken spaces are also produced by some proportion of a brick. In sketch 3 a series of vertical panels is made to fill up the space of a pier between two window jambs; each hollow square is formed at regular courses or intervals in the bond. The result is agreeable when not carried too far, and a legitimate mode of getting ornamental effects out of the ordinary brick. Sketches 5 and 6 represent two methods of filling in to arches and panels. In the first, the bricks are placed at a square angle, forming a zigzag pattern in red and dark-coloured bricks. They require to be truly set out on a board or template, cut to the form and radius of the arch, so that the angles my lie vertically aligned, and the bricks cut and rubbed to fit closely to the curve of the arch. The next pattern, 6, is an arrangement of 6in. brick blocks or tiles in a panel of brickwork, each tile, of course, being made to range with every two courses of the brickwork. The tiles can be slightly sunk below the brick face or fixed flush with it. Sometimes panel borders are made to surround the tiles, when more finish is required, and various patterns of moulded and enriched borders, all manufactured with mitres (see "Brick Ornament," by James Brown). This kind of decoration is very extensively employed, though sometimes from a wrong motive. It is not legitimate brickwork, and may be made to do duty where real brick-setting and carving would be better used. Tile ornamentation offers itself so readily to inferior brickwork, that in the hands of speculative builders it is often introduced in places where it ought not to be placed. We have seen it in panels between windows, in pilasters, and in friezes—positions it may occupy when not obtrusively introduced, and when the plain work is carefully executed.

In spandrel decoration to arches this kind of treatment is admissible, and we shall give a few examples when we come to arch work. We prefer the moulded brick to the tile for diapers, panels, and stringcourses, and these are made in great variety of patterns, 6in., 9in., and 12in. square, and in red or white, and admit of various combinations. The smaller the size of tile the better for bonding with the brickwork, as the settlement of the backing is less liable to fracture the brick facing. If larger patterns are desired than those contained in the 6in. square, four of these bricks may be made to form a 12in. panel by designing the repeat on one block to correspond with the other quarters. The simpler forms are always the best for wall decoration, as the distance from the ground and the distribution of light ought to be considered, besides the blackening effect of soot and dust.

ST. MARY'S CHURCH, AYLESBURY BUCKS.

By FREDERICK GEORGE LEE, D.D., F.S.A.

IN the time when John Leland wrote his *Itinerary*, as therein set forth, he put on record the following:—"There is but one Parech Church standing west-north west in it [i.e., the town], but that is one of the most ancientest in all those quarters, as it appeareth by the Life of Saint Osith, Querendon, a mile and an halfe from Alesbury; also Burton [i.e., Bierton], and Alesbury in Chilterne, 3 miles of by south, with dyvers other Hamletts, were in Alesbury Parish."*

This related to the period when the Tudor changes had commenced, *circa* 1536. But the origin of the "Church of our Blessed Lady of Aylesbury," as it is termed in the Registers of Lincoln, is lost in obscurity. Originally belonging to the diocese of Dorchester, in Oxfordshire, it became a portion of that of Lincoln, when the former was transferred to the north, under Bishop Saint Remigius (A.D. 1067—1092). At this time it was probably constituted a prebendal church, having five daughter chapelries: St. James's, Bierton; St. Peter's, Quarrendon, Elles borough, Stoke Mandeville, and Buckland.† It name and dignity are still retained by an inscription on one of the stalls in Lincoln Minster.

In all probability a sacred edifice of some kind was erected on the hill of Aylesbury during the rule of St. Birinus, Bishop of Dorchester, or one of his earliest successors. For there exists a very ancient and possibly Early Saxon crypt under what is now known as the "Lady-chapel" of Aylesbury Church; while fragments of stone with Saxon or Early Byzantine carvings,‡ were found in the foundations of the piers of the tower when its pillars were reconstructed and

* *Itinerary* of John Leland, Vol. IV. p. 191, &c.

† Register Book of Oliver Sutton, Bishop of Lincoln appointed A.D. 1280.

‡ It is not always easy to identify Anglo-Saxon remains which have been cast down from their original position and been mixed with stone *débris* of later periods. The carvings were often mere surface marks, while the use of Roman tiles and the method of construction alone often served to identify their historic character. This Sir Scott found out in his Report regarding the crypt Wing.



S. Mary's Church, Aylesbury, Bucks ~ 1889 ~

rearranged; while the existing font (remarkable amongst the many such stone *instrumenta ecclesiastica* of Buckinghamshire) is of very considerable antiquity, though much later than the crypt. Several traditions assert that St. Osyth, who was born of noble parentage at Quarrendon, less than two miles from Aylesbury, was originally buried at the latter place, though subsequently her remains (or, at all events, part of the same) are reported to have been translated to a church at St. Osyth's in Essex.

The present church of Aylesbury—formerly of prebendal rank—was originally of the First-Pointed style, and probably cruciform in plan, when that church was first erected. The more ancient Saxon church, no doubt, had its chancel over a crypt on the site of the present Lady-chapel,* and any Norman additions were originally made to that building and grouped round it. But when the First-Pointed church was planned and erected, both nave and chancel were placed a little northwards of the more ancient sanctuary, that sanctuary being henceforth styled "the Chapel of Our Lady," and the Saxon crypt subsequently was probably used only as a charnel-house, for several cartloads of human bones—and nothing but bones—were removed during Sir Gilbert Scott's restoration, and were buried in the churchyard around. As much as 5ft. or 6ft. of earth surrounded some portions of the foundations and walls of the First-Pointed edifice, the confined churchyard being unusually overcrowded.

This First-Pointed building—which, in later styles, has been substantially altered and added to—was, I am inclined to hold, built between the years 1180 and 1235—i.e., when Walter of Coutances, Hugh of Grenoble, William de Blois, and Hugh Wallis, in their turn and in succession, sat in the seat of Bishop Remigius.† Under each of these prelates of Lincoln church building flourished remarkably, and it is clear that Aylesbury was blessed and benefited by their influence. The proportions of Aylesbury Church, with its central tower and spirelet (for it evidently possessed the latter, if not a formal spire), were symmetrical and pleasant. The lancet windows of the chancel, with triplets of lancets at the east end and the north and south ends of the transepts, would have given simplicity and solemnity to the whole structure. The chapels to the north, and later insertions of windows, clerestory, and considerable reconstructions of both transepts in the 13th, 14th, and 15th centuries, were additions made with such architectural cost, and generally with such sound feeling, that, one and all, they detracted not from the symmetry of the well-proportioned old building.

As regards dimensions, I give them as measured within the walls before the latest restoration of the church. The nave is 77ft. 10in. long by 27ft. and 1in. wide; the tower is 21ft. 2in. (measured east and west) by 27ft. 1in. (measured north and south); the chancel is 40ft. 8in. long by 26ft. 5in. wide, and lies, in plan, a little to the north. Thus, the whole building is exactly 139ft. and 8in. long. The transepts are about 35ft. by 22ft., making the church's cruciform character of good and striking proportions.

At present the chancel towards its western part has aisles, with a vestry on the north and a living-chamber over it for the custodian and watcher of the church. Here above is an ancient fireplace, and an equally ancient window; below, the vestry may have been used for the treasury of the church, for the walls are thick and the windows small. Here likewise is a remarkable oaken vestry press, with a swinging vestry-horse for copes, chasubles, and dalmaticks. This room is now filled with all kinds of dusty rubbish—withered floral decorations, and all the artificial zinc and tin trumpery with which such decorations are foolishly allowed to be put up. The old door, with its iron floriation and ancient lock and bolt are of special interest. There is another vestry to the south. The ancient screens which divided off the chancel and transepts from the nave are, alas! destroyed*: the modern squat construction at the choir entrance being poor, paltry, and quite unworthy of its position. Of the rood-loft not a trace remains, though some of the old choir-stalls with their carved misereres are still in existence. On the north side of the chancel aisle the organ now stands. There is an aumbrey on the north side of the chancel sanctuary, an Easter sepulchre, and a piscina. The east end is most ineffective and poor—quite unworthy of such a church. The Debased five-light Perpendicular window of the east end has given place to a three-light lancet-window to match those on either side; but the levels of the floor are all bad, and the whole east part very poverty-stricken, dark, and depressing. Willement's glass, a deep blue, is at once gloomy, inartistic, and ineffective, while the Communion-table is far too small, and wants elevation, proper furniture, and dignity. The gas standards are over-ornate, flashy, and lack simplicity. The pulpit in the nave, too high, contrasts badly with the mean altar-table.

There is a fine five-light Second Pointed window in the north wall of the north transept, well worthy of special notice; and many of the windows in the chapels and aisles on that side of the church are of the same general type. An Early English piscina on a bracket in the east wall of the same transept is also curious and effective, if not unique. The adjacent piscina is likewise good. Above this transept, as is evident on inspection, there was anciently a chamber of Third Pointed construction—either a treasury, sacristy, or record-room. It was entered from the stone staircase at the north-east corner of the tower; from which also the rood-loft was entered by an existing doorway below.

* One arch of the crypt here is certainly of Anglo-Saxon work, as a friend, who inspected it minutely before it was bricked up, assures me. Its characteristics were too marked to be mistaken. It should be added that for the future security of the tower, after restoration, it was essential that several adjacent vaults and brick graves should be filled up.

† At this period the parochial churches of Crendon, Dinton, Cuddington, Wing, Ellesborough, Towersey, Monk's Risborough (in Bucks), together with those of Bicester, Thame, Stanton St. John's, Thame Prebendal House, and Milton (in Oxon) were built: several of these on the sites of more ancient edifices. The abbey churches of Thame Park and Notley, likewise, were erected about this time.

* Fragments of some of these are preserved in private houses in different parts of the town. Some Jacobean carvings, turned out from the church, are in the house of Mr. Gibbs, F.S.A., of Church-street.

Many of the dilapidated and blocked-up windows were restored under Mr. G. G. Scott, in 1857, and much of the work was done in a thoroughly artistic and conservative spirit. Wherever precedents were found they were followed. The chapels, transepts, roofs, and aisles were one and all repaired, and subsequently the exterior of the church was most efficiently renewed. In the Lady-chapel—at the cost of the present Dean of Lichfield, whose zeal, good taste, and munificence were constantly apparent when he was vicar of Aylesbury—Mr. Scott restored the Second Pointed sedilia with the adjacent piscina. The old sacristy to the north was left very much as it was found. The rash and *harum-scarum* removal of monuments and tablets, however, was quite uncalled for and unjustifiable; for they had been liberally paid for by handsome fees to former vicars, and they helped to furnish the walls, which, at present scraped and clean, are as bare as it was possible to make them. Now, *Hic jacet* too often records that which is not true.

Few churches had been more disfigured than that of Aylesbury. The Tudor changes were sweeping and notable. Every altar in the church, and these, including those in the western chantries and the Lady-chapel, numbered altogether thirteen, were hewn down and destroyed in the second year of Queen Elizabeth, though some had been already removed under Edward VI. A handsome rood-screen of oak (with rood, Mary and John) was then destroyed, and a stone shrine or cluster of tabernacles, filled with statues, in the north transept was removed. Two altars against the eastern wall of the south transept, with "their retables and garnyshings," were also taken down, though the predella or platform of one of these remained perfect until quite recent times.*

I gather from specifications and directions in certain old wills of this "Peculiar" that the tower was divided from the north and south transepts by high screens, which, with the internal arrangements of the pre-Reformation era, rich hangings, lamps, images, gave such a furnished appearance to the church. There was a small pulpit or lectern on wheels, which could be moved about as necessity arose, and as congregations gathered; and I have some reason for coming to the conclusion† that the organs in the church, of which there were at least "two pairs," could be carried from spot to spot for use in this chapel or that as convenience suggested.‡

There were certainly altars in honour of Our Lady and St. Osyth (the high altar) of Our Lady, in the Lady-Chapel, of St. Osyth and of St. Hugh in the south transept, of St. John in the chantry of Singleton and Baldwin, of St. Michael and St. Peter in the north transept, of St. Crispin, St. Nicholas, and St. Christopher in other parts of the church.§ The piscinæ of most of these remain, and have been restored. There was also an altar, of the ornaments of which the Aylesbury family of Ellys were the appointed custodians. Its name, however, is not on record. In one Will which I consulted (that of Peter Osborne, A.D. 1415), an allusion is made to "a table of the sepulchre of Christ"—*i.e.*, a sculpture in stone—before which hung three lamps, or brazen bowls, filled with a thin coil of wax candle, styled a trindle, which lamps were lit on certain feast days—notably "Palm Sonday" and "White Sonday"—and family commemorations.

Originally the organ, built by Green, of Litchfield, in 1782—given by a benevolent parishioner, Mary Pitches, together with £500 invested towards paying an organist — stood in a huge gallery under the tower, facing westward, where the choir also officiated. Afterwards, in 1801, the organ was removed to a deep gallery at the west end of the nave. Now it stands to the north of the chancel. At the period first mentioned, the transepts and choir were entirely cut off from the nave—the latter being only used for marriages, when celebrated, and once a quarter for the Communion. In the south transept were kept the fire-engines, buckets, ladders, biers for funerals, spades, pick-axes, planks for graves, &c. The north transept at the same period, was boarded off and wholly disused. Public worship was confined to the nave, which was filled with pews of every height, form and irregularity.

The font is large—nearly 3ft. in diameter—and of good, First Pointed work of a very Early date. It has a band of archaic foliage round its top, with a fluted ornament below, and then a chevron-like moulding towards the base, which is rectangular. Its height is 3ft. 5in. Other fonts of the same general tpye are found in several parts of the county.

In the belfry there are eight bells, well and efficiently hung; but only one of these is of any antiquity—the *Sanctus* bell, recast in 1612. Seven of the peal were recast by Pack and Chapman, of London, in 1773, and the tenor bell was recast by Mears, of Whitechapel, in 1850. Each one has a piece of rhyming jargon running round it, utterly different to the old inscriptions, generally so terse and appropriate. The Aylesbury peal, however, is exceedingly musical, and can be heard, on a summer Sunday evening, many miles away. The ancient customs of ringing and chiming at divine service, weddings, and funerals, &c., are, in the main, retained. In this particular faithful traditions have effected more than written law.

In the north transept there remains the effigy in marble of a knight, under a Second-Pointed canopy.* But it is not known whom it represents. It is said to have been brought from the site of the old Grey Friars' Church, long since razed to the ground.

Two stone coffins remain outside the church, with good floriated crosses running down their whole length. Rumour has it, however, that one of these is a restoration.

In the north transept is a handsome Tudor tomb of marble and alabaster to the Lady of Sir Henry Lee, K.G., of Quarrendon, with elaborate armorial adornment. Alabaster statues of herself, her grown-up daughter, and two chrisom-children remain. She was one of the daughters of William, first Lord Paget of Beaudesert, a faithful servant of Mary Tudor, and a very upright man. Lady Lee died in 1584. This tomb has been twice removed, and the iron railings formerly protecting it have been destroyed.

What remained of interest in the sacred edifice after the vast Tudor changes was destroyed during the time of the Rebellion. Aylesbury and its adjacent parts—as a local historian has abundantly shown — were simply devastated during the Civil War.† The church itself was made ruinous, all the stained glass had been smashed, and every memorial brass removed. The font for awhile was hidden, to preserve it. Of modern glass there are several specimens; but the want of artistic success is apparent in some of the windows, which, as a rule, are too heavy, confused, and opaque. One artist should have been employed for the whole, for the sake of uniformity and harmony—both of which are now wanting.

There are memorial stained-glass windows, to the Rev. J. R. Pretyman, vicar; to William Rose, barrister; to John Gurney; to John and Elizabeth Kersley Fowler; to Francis Wilson Oliphant; to John de Veulle; Thomas Tindal, and Anne his wife; to Thomas White Field, and Anne his wife; to Thomas Bigg; to Z. D. Hunt; to William Rickford, M.P., and Mary his wife. Another window was subsequently put up by Thomas Perrin, a second to the memory of Thomas Hatten, and Rebecca his wife, a third to the memory of Edward John Pretyman, and a fourth, subject "the Three Marys," by Mrs. Jordan, of Wakefield, to the memory of Alice Ivatts, of Aylesbury. All these certainly add to the dignity and solemnity of the building, and are said to have cost together more than £14,000.

An excellent lectern of brass, with the customary eagle for the Bible, was presented by Mr. H. A. Paston-Cooper and his wife, to the memory of some relations, and there is a simple and unpretentious Litany-stool, placed in front of the chancel gates. The new oaken pews or sittings are of good design, low, convenient, and uniform.

Sir G. G. Scott's plan of sweeping out everything in a large, complex church, and in making one vast *auditorium* or preaching-house of nave, transepts, aisles, and chapels, is without precedent and a dead failure. Such was also done by him at Tewkesbury Abbey. Old churches were not built for this. Had two or three small chapels been fitted up for occasional or weekday services, the obvious convenience and comfort of such would have been appreciated. Now a dozen scattered worshippers alone are gathered on a weekday, where 1,500 might be easily accommodated, making desolation and emptiness all the more needlessly apparent.

Amongst the local and Buckinghamshire families to whom monumental memorials—some handsome and costly—exist, may be mentioned the following:—Farmborough, Ludgate, Read, Bell, Rose, Morley, Dell, West, Bernard (baronet), James, Phillips, Farrer, Stubbs, Delafield, Howse, Hodskin, Marlow, Terry (an altar tomb), Fell, Dagnall, Mead, Hickman, Rickford, Hunt, Heywood, Williams, Smith, White, Ellys, Lloyd, Tindal, Pretyman, Ceeley, Perrin, Bigg, Paston-Cooper, Field, Hatten, Ivatts, Woodman, Dawney, Payne, Atkins, Fowler, Stedman, Deverell, Eagles, Hayward, Grace, Wheeler, Prickett, Prowett, Thorp, De Fraine, Neale, Holland, Sheriff, and Deacon. Numbers of the old gravestone inscriptions are becoming illegible. The churchyard, very much overcrowded, was closed in 1857, and a large cemetery opened on the road to Tring.

The external effect of the church—though, perhaps, somewhat too squat for its admirable position—is, on the whole, good. The tower, with its battlemented cresting and small lead-covered spirelet surrounded by eight pinnacles above, is exceedingly graceful; while the old Early English chancel, with its severe buttresses and lancet windows and solid roof, is, on the whole, very good. The transepts are exceedingly dignified and of excellent proportions. The clerestory of the nave is somewhat wanting in architectural character; but the west end of the nave, having a good reproduction of the original chief entrance, is admirable, as is also the south porch. Outside there is an entire absence of empty niches containing nothing—a feature far too common in modern restorations. Here the statuary is at once artistic and effective. The sacred building looks well and picturesque from every point of view, and is now in excellent structural condition—a real credit to those who contributed to its complete restoration, and to the town. It rivals the church of Chipping Wycombe both in size, character, and general dignity. It is, however, as no one can deny, badly wanting in memorials and objects of antiquarian and archæological interest swept away in 1543 and 1640.

* Probably this was the altar and shrine of St. Osyth, the actual shrine containing the body or part of it being placed under or behind the altar slab.

† Much of the information provided above was obtained by me from an inspection—by favour of Sir James Hannen—of about 500 unindexed "Wills of the Peculiars of Thame, Aylesbury, Bierton, and Great Milton," formerly in the keeping of the local authorities, but now at Somerset House.

‡ These organs were mere frames, with a few dozen pipes, having a hand-bellows. I inspected two, small in size and quite portable, but of some antiquity, for sale at Venice in the year 1877. They had belonged to a church then recently pulled down.

§ There appears to have been an altar facing eastward on either side of the doors of the choir, placed under the canopied sweep of the rood-screen; and each altar sanctuary was inclosed by pews—i.e., by low, railed-in, protecting screens of wood.

* This has been described and dealt with, in a very interesting paper, from the pen of Mr. Gibbs, of Aylesbury, F.S.A., in the Library of the Society of Antiquaries. He is, however, unable to identify the armorial bearings of the effigy.

† "History of Aylesbury," by Robert Gibbs, F.S.A., p. 47. Aylesbury, 1885.

AN EXHIBITION OF ARCHITECTURAL PHOTOGRAPHS.

TO-DAY, at the Royal Architectural Museum at Westminster, an exhibition opens to the public comprising a series of about one hundred and fifty photographs illustrating the architecture of Norfolk on the borders of the Wash, and those places in Lincolnshire and Cambridge visited by the excursion party of the Architectural Association last month on the occasion of their visit to King's Lynn. All the pictures are by Mr. John L. Robinson, A.R.H.A., of Dublin, whose camera studies in connection with these annual outings are now so well known to our readers, and the series here on view, in spite of the unfortunate weather during the week of the excursion, are, on the whole, well up to the standard of excellence hitherto obtained by Mr. Robinson. As we have so fully described the buildings seen on the occasion referred to, we need hardly particularise many of the views now shown in detail, though a very large proportion of them illustrate work which was not shown by the sketches which we were enabled to publish with our report of the proceedings. Taking the prints, however, briefly, in the order in which they are arranged for exhibition, we may note, after the views in King's Lynn of the Custom House, Town Hall, and churches there, an exceptionally good large view of West Walton, showing the detached tower and church from

the south-west, and bringing out the Early English west portal in admirable detail. The stalls in the Wiggenhall Churches, and the roofs and other woodwork in these buildings, as well as at Holbeach, Walsoken, Moulton, Walpole St. Peter, Leverington, and other places, furnish capital subjects for several similar photographic pictures. The large one showing the nave benches at Wiggenhall, St. Mary Magdalen, and the parish font there (No. 4) deserves to be singled out specially for notice. No. 6, giving a detail of W. Walton south porch, leaves nothing to be desired, both for architectural purity of design and excellence as a silver print. The church at Castle Acre figures in Nos. 8 and 9, and the Priory ruins in 10 and 11 are quite among the best views of the series. Others (Nos. 69, 70, 71, and 72) in the smaller series furnish further illustrations of the same grand subject. Oxburgh Hall, the Flemish like brick house which attracted so much attention, appears in Nos. 12, 13, and 81, while Oxburgh church with its terracotta tombs occupies Nos. 77, 78, 79, and 80. Gedney and Long Sutton in Lincolnshire are faithfully represented in Nos. 14 and 15, with others numbered 82, 83, 84, 85, 86, and 87. Holbeach, Whaplode, and Moulton occur in a whole set of prints artistically chosen for architectural effect. The great altar tomb at Holbeach is perhaps the most telling of the series (No. 18). A group at Hillington Hall is a curious sun picture, supplying some odd effects hardly to be accounted for. Harpley and Snettisham churches in their way are unique in points of detail, particularly the letter, with its graceful central spire and western narthex, which figure grandly in view No. 22. Houghton Hall and Sandringham House supply some interesting subjects depicted in prints numbered 20, 23, 99, 100, 101, 102, 103, and 104. A fitting contrast to these lordly examples of Domestic architecture in Norfolk is supplied by the view of the quadrangle at Castle Rising Almshouses, showing the old dames in the sugar-loaf hats and red capes worn by the recipients of the charity. As a picture this print, No. 110, is surpassed by none in the exhibition. The cathedral-like church of Terrington St. Clement's well repays the artist for his copious selection of views, showing it from all points of the compass in Nos. 24, 25, 116, 117, 118, and 119. Bircham, Dersingham, Sandringham, and Castle Rising Churches occupy other views hung near these last, and Walpole St. Andrew's comes well in No. 120. The truly grand church of Walpole St. Peter's is done justice to by Mr. Robinson's studies, marked 26, 27, and 28, with detail views of parts inside and out, numbered 126, 127, and 128. Tilney All Saints, in views 130, 131, 132, 133, and 152, supplies many points well worthy of record, and the same may be said of those devoted to Swaffham, Spalding, and Narborough. Ely Cathedral is, of course, the grandest subject of all, and a large number of these photographs are devoted to its ample illustration, capitally chosen and rendered, many of them showing portions probably never before photographed, as, for instance, those from the Lady-chapel. Peterborough Cathedral, too, is represented thoroughly well, showing Mr. Pearson's recent work there, as well as some parts of the unrestored exterior. The gravestones from the precincts, the gateway, and the market-house are other good views. The show in Tufton-street remains on view for a week—admission free.

TERRACOTTA AND STONE.

THE extensive employment of terracotta in the exteriors of buildings ought to leave no doubt in the minds of most people that in the hands of the architect who will have what he wants, and takes some trouble to get the blocks properly made, the material has a future more lasting than stone for our town architecture. The slowness with which the material has fought its way into favour among the profession has been owing to the extreme difficulties encountered in getting it made properly, and the great delay in supplying it. These obstacles to its successful use have now been overcome, as there are a few leading firms who are ready to supply the material with the least delay. We have only to call to the reader's mind the works executed in this material by Mr. Waterhouse, Mr. Collcutt, and Messrs. George and Peto, to prove that every treatment for which stone is employed can be rendered in terracotta. Of course there are differences to be observed by the architect in the details, a flatter treatment of the mouldings, avoidance of deep hollows and undercut appearances; but with these exceptions we have buildings displaying as much artistic charm and poetry in this modern material as we have in stone. The natural beauty of stone will, of course, always be recognised where it can be used without danger of quickly perishing; but our street buildings in which the red Mansfield has been used have shown but a very partial record of durability. Nor do we recommend an admixture of stone and terracotta in the same building, except when architectural or sculpturesque effects have to be produced here and there. A surprising want of determination is shown now and then. The other day we saw a building in which stone was introduced for the most exposed parts, like the ornamental gable copings, labels, and cornices, and terracotta was reserved for those parts which were more protected, such as the wall dressings and friezes. It would have been more consistent to have carried the terracotta throughout externally, as in the very pleasing church designed by Messrs. Ernest George and Peto at Streatham Common, where the copings of gables, bell turret, cornices, buttress weatherings, and the whole of the tracery of the windows (Perpendicular) and the inside arcades are wholly executed in terracotta. Not a vestige of stone is apparent. In the Strand, Fleet-street, and in other City thoroughfares the material has been introduced, and, as far as our observations have extended, the drawbacks inseparable from the use of the material have been overcome. For example, take the Legal and General Offices, designed by Colonel Edis, in Fleet-street; the large red-brick block of buildings facing Southampton-street in the Strand; the Constitutional Club, and several important business premises in Regent-street, Oxford-street, Bond-street, and Piccadilly—in all of which the lines and angles have been well maintained. There are scarcely any defects to be noticed from shrinking or warping in the firing, and the colour is uniform, and the imperishable nature of the surface intact. Ten years ago there were those who advocated the claims of terracotta as a material worthy of being employed instead of stone; now these apologists are hardly needed, as stone is becoming almost the exception. The results have been beneficial. Keeping the projections and members down is one of the valued results of the employment of the revived material. When stone was the rule, deep cornices, projecting mouldings, and carved capitals were met with. In a few years the acid-laden atmosphere began the work of corrosion, and quickly left the moulded work a worn and rounded friable surface. Large pieces of the projecting features cracked by the frost and fell away; scarcely an arris was seen in the general crumbling of surfaces. A further result has been that architects have studied the subject of brickwork more than formerly. In the stone-dressing days architects designed their stonework very often in supreme indifference to bond; quoins and other features which required range with the courses were often found unable to do so, and repeated objections were made by the bricklayer in setting the stonework of entablatures, arches, weatherings which were made to sizes that did not suit the bond or the convenience of brickwork. Terracotta has compelled a more rigid discipline in this respect, and architects who have employed it have learned the value of bonding in its fullest sense, greatly to the progress of the art of brickwork. With regard to cost, the advantage has been on the side of terracotta, for although in small specially-designed buildings where the material has to be prepared the expense is almost equal to stone, the difference is considerable where there is a repetition of the same moulding or pattern, as an immense amount of labour is saved in all mouldings and ornament. The great drawback is the uncertainty of obtaining the blocks in time for the workmen; when once manufacturers and architects can accommodate each other in this respect the employment of the material will be doubled.

BASEMENTS AND LODGING-HOUSES.

THE local authorities of many towns are remiss in enforcing the regulations of the Public Health Act in regard to basements and lodging-houses. The 71st section expressly provides that it shall not be lawful to let or occupy as a dwelling any cellar or underground room built or rebuilt after the passing of this Act, or which is not so let or occupied at the time of the passing of the Act. Yet in many large towns the law appears to have made little difference in the occupation of underground rooms, if we are to judge by the number of persons who dwell in them. The next section prohibits the occupation of any cellar whatsoever unless certain conditions have been complied with—a clause which explains in some measure the existence of this class of dwelling in towns. The fact of the matter is that all such cellar or underground rooms let or occupied before 1848 which have been made a little habitable by a few alterations of a trivial kind, have been suffered to remain as dwellings. What are the nature of the requisitions? They are briefly that the basement must be at least 7ft. in height, 3ft. of which is to be above the street surface; that an area must extend along the frontage of, at least, 2ft. 6in. wide in every part, 6in. below the floor of room; that the cellar must be drained, have a w.c. or privy, and an ashpit appurtenant thereto; that there be a fireplace, and a window of at least nine superficial feet in area clear of the sash-frame. These are the main recommendations, and are certainly good as far as they go; but they do not go far enough. According to this regulation any sized basement of 7ft. in height, 3ft. of which is above the outer-ground level, having a fireplace and window, and with a drain, can be used. The window may be very small compared with the dimensions of the room, and may therefore be a dark, loathsome place for living in; the closet and ashpit may be dangerously close to the inmates. The provisions ought to have been more explicit; the window opening should, at least, be proportioned according to the size and area of room, and be placed as near the ceiling as possible. An area of 9 superficial feet is only equal to an opening 3ft. each way, and would be ridiculous for a room which extended back, say, 15ft. or 18ft. from the front, and was 12ft. or more wide. An area of 2ft. 6in. wide is absurdly narrow; at least 3ft. ought to be made the minimum width. With regard to the drains, no provision is made to check the overflow of the sewers into the drains in case of a flood—one of the dangers and chief inconveniences to which occupants of underground rooms are subjected. Inadequate as the regulations are, we venture to say that in some crowded neighbourhoods they have been very imperfectly carried out; the rooms are often stuffy, badly ventilated, and damp. More attention ought to be paid to the soil, the construction of the external walls, whether they are damp or are built with damp-proof courses. Thus, although the law is prohibitive of dwellings of the kind we refer to, hundreds of families are found that live in basements, which the Act has only made barely tolerable. The Act is almost as inoperative in the case of houses. Although by the same Act it is provided that every house kept as a common lodging-house must be registered, inspected, and approved by the local authority, it is evident that many houses are placed on the register that are structurally unfit for the purpose; built for a small family, they are let out to a number of lodgers. We cannot be sure that the house is structurally safe or in a sanitary condition, unless the inspection is of the most thorough character. The inspecting officer ought to be able to examine every detail of the house: its foundations to see if it is dry, the drainage and their connections, guttering, the paving of areas, to see whether the soil-pipes have any connection with the drains, and if so, to disconnect and ventilate them. Most necessary it is to see that the closets are in proper situations, and well constructed, and one for so many persons; that the water supply is good, and the water stored in desirable places that cannot be readily fouled by the occupants. That receptacles for refuse and for food should be ample. Each room should have a chimney and a fireplace, and the number it can conveniently hold should be stated, allowing at least 300 cubic feet for each person in bedooms. The staircase provision should be sufficient to insure safety; the washing accommodation ample. We are not very sure whether all these requirements are within the power of the inspector to discover, and whether it is possible to find houses let for this purpose that can be converted without much cost to make them accommodate a large number of persons. We know how the better kind of lodging-houses in fashionable seaside places are converted. The large rooms are sometimes par-

titioned to obtain more bedrooms; the basement or kitchen offices are made to provide sleeping accommodation for the keeper and his family, thereby diminishing the accommodation for cooking, storage, and other purposes. The authorities, it is true, have power to make by-laws for fixing and varying the number of common lodgers, for promoting cleanliness and ventilation, for precautionary measures in case of any infectious disease breaking out; but this power is not very often exercised. A safer and better system of regulation can be enforced when authorities take the power into their own hands of certifying houses built for letting to more than one family, thereby discountenancing the present tinkering plan of the conversion of houses.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—LIV.

By HENRY LOVEGROVE, F.S.I., Surveyor.

A VILLAGE ELEMENTARY SCHOOL.

JOINER (CONTINUED).

FOUR TWO-LIGHT WINDOWS WITH TRANSOM.—BOYS' SCHOOL.

ft.	in.	ft.	in.		
4	2	13	9		
			4		
		3	9	2	Fir wrot., framed, rebated, beaded, and moulded frame.
4	2	10	3		
			4		
		3	6	10	Add above transom.
4	2	2	6	40	0 5in. by 2¾in. oak sunk, weathered, grooved, and throated sills.
4	2	2	6	40	0 Galvanised iron tongue and groove in oak and Bath stone sills and white lead, and bedding sills in with lead.
					16 Frames bedded and pointed in lime and hair, the reveals screeded.
4	2	2	1		
		4	5	73	6 2in. deal moulded casements filled in with extra stout bars, to form small squares, hung on butts.
4	2	2	1		
		2	8	44	5
					16 Pairs 3in. brass butts.
					8 Tonks' brass-wedge casement fasteners.
					8 Do. stays.
					8 Elsey's patent opener for casement on butts 11ft. from ground.
4	2	1	11		Hartley's ribbed glass, ⅜in. thick in small squares.
		4	6	69	0
4	2	1	11		
		2	6	38	4 Add do. do.
					16 frames 4c. white.
					16 do. s.s. and 2ce varnish.
					112 small squares 4c. white,
					112 do. s.s. and 2ce varnish.
4	22	7		90	4 3in. by 1in. wrot. and rounded window lining, tongued at angles and to frame.
4	23	9			Deal ¾in. wrot. framed and moulded
		4½		35	7 grounds.
4	23	9		95	0 Deal 3in. moulded architrave mitred.
4	5	9		23	0 Deal moulding out of 4in. by 2in. on transom.
					8 ends scribed and fitted to stone.
4	4	9		19	0 4in. by ¾in. deal wrot. grounds moulded
4	3	0		12	0 both edges.
					16 ends fitted.
4	4	9		19	0 3in. architrave moulding as before.
4	3	0		12	0
					16 ends fitted.
4	7	3		29	0 1½in. deal wrot. and rounded window board, 4½in. wide tonged to oak sill.
					8 Mitred and returned rounded ends.
					8 Notchings.
4	7	6		30	0 Deal moulding out of 2¾in. by 2in. planted on under window boards.
					8 Mitred and returned moulded ends to moulding.
	5	9	5		9 Groove in oak for window nosing.
4	2	2	6	40	0 Smith's or other approved water bar.
4	22	7			
			4	30	1 Add on lining.
4	23	9			
	1	0	95		0 Add on architrave.
4	5	9			
			8	15	4 Add on moulding to transom.
4	4	9			
	1	0	19		0 Add on architrave.
4	3	0			
	1	0	12		0
4	7	3			
	1	0	29		0 Add on window nosing.
4	5	5			1½ B. in mortar, ddt. for windows
	8	0	173		4 averaged.
4	7	0			Ddt. extra on brickwork to Kentish rag,
	8	0	224		0 random rubble facing in stone of good colour; no rusty stones to be used; the facings to average 7in. thick with proper bonders, the joints to be neatly pointed with cement.

WINDOW HEADS AND SILLS, &C., TAKEN WITH OTHER STONE.

4	5	9			Ddt. R. F. and S. walls and 2cc dis-
	8	3	189	9	distemper.
4	7	3			
		6			
		4½	54	6	Fir lintels
4	7	3	29	0	Extra to rough relieving arch over do. in 2 half-brick rings in cement.
					24. Wood fixings slips.
					24. Lead plugs, &c., as before.

FORM TWO-LIGHT WINDOWS, GIRLS' SCHOOL, AND 4 WITH PEDIMENTS OVER.

ft.	in.	ft.	in.		
4-4	2	12	3		
			4		
		3	16	4	Window frame as before.
4-4	2	9	3		
			4		
		3	12	4	Add. do.
4-4	2	2	6	80	0 5in. by 2¾in. oak window sill as before.
4-4	2	2	6	80	0 Galvanised iron tongued and groove in fir and oak, and white lead and bedding sill.
				32	Frames bedded and pointed as before.
4-4	2	2	1		
		3	8	122	2 2in. deal moulded casements as before, hung on butts.
4-4	2	2	1		
		2	0	66	8 Add. do. do.
					32. Pair 3in. butts, brass.
					16. Tonks's brass wedge casement stays.
					16. Tonk's brass casement stays.
					16. Elsey's patent opener for casement 10ft. from floor.
16		1	11		
		3	6	104	9 Hartley's glass in small squares as before.
16		1	11		
		1	10	56	2 Add do. do.
					32. Frames 4c. white.
					4. Do. S.S. and 2ce varnish.
					272. Do. S.S. and varnish.
					272. Squares small 4c.
4-4	20	1		160	8 3in. by 1in. wrot. and rounded window lining as before.
4-4	21	3			
		4½		63	9 ¾in. wrot. grounds as before.
4-4	21	3		170	0 3in. architrave moulding mitred.
4-4	5	9		46	0 Deal moulding out of 4in. by 2in. on transom.
					16. Ends mitred and fitted to stone.
4-4	4	0		32	0 4½in. by ¾in. deal, wrot. and mlded.,
4-4	2	6		20	0 both edges grooved as before.
					32. Ends scribed and fitted.
4-4	4	0		32	0 3in. architrave moulding as before.
4-4	2	6		20	0
					32. Ends fitted, &c.
4-4	7	3		58	0 1½in. wrot. and rounded window-
					board, 4½in. wide as before.
					16. Mitred & returned rounded ends.
					16. Notchings.
4-4	7	6		60	0 Deal moulding planted on under window-board.
					16. Mitred and returned moulded ends to do.
4-4	5	9		46	0 Groove in oak for window-board.
4-4	2	3		18	0 Smith or other approved water-ba
4-4	20	1			
			4	214	2 S.S. and varnish on linings.
4-4	21	3			
	1	0	170		0 Add on architrave.
4-4	5	9			
		8	30		8 Add on moulding on transom.
4-4	4	0			
	1	0	32		0 Add on architrave.
4-4	2	6			
	1	0	20		0
4-4	7	3			
	1	0	58		0 Add on wrot. nosing.
4-4	5	4½			
	6	9	290		3 1½ B., ddt. in mortar.
4-4	7	0			
	6	9	372		0 Ddt. Kentish rag facings as before.
4-4	5	9			Ddt. R.F. and S., and 2ce dis-
	7	0	322		0 temper walls.
4-4	7	3			
		6			
		4½	108		9 Fir lintel.
4-4	7	3	58		0 Extra to ro. relieving arch as before.
					48. Wood slips.
					48. Lead plugs and running in stone for fixing joiner's work.

FOUR-LIGHT WINDOWS, GIRLS' CLASS-ROOM.

4	11	9			
		4			Fir wrot. framed rebated beaded and
	3	3	11		moulded frame.
4	8	9			
		4			
	3	2	11		Add. above transom.
4	2	2	6	20	0 5in. by 2¾in. oak sill as before.
4	2	2	6	20	0 Galvanised-iron tongue and groove in oak and Bath stone sill and white lead, and bedding sill in white lead.
					8. Frames bedded and pointed as before
4	2	1			
	3	8	30		6 Deal moulded casements hung on butts
4	2	1			as before.
	2	1	17		4
					8. Pair's 3in. brass butts.
					4. Tonk's brass wedge casement fastener.
					4. Do. stays.
					4. Elsey's opener for sash on butts 11ft. from floor.
4	1	11			
	3	5	26		2 Hartley's glass as before in small
4	1	11			squares.
	1	10	14		1
					4. Frames 4c. white.
					4. Do. S.S. and 2ce varnish.
					68. Squares small 4c. white.
					68. Do. s s. and 2ce varnish.
					247. Deal linings rounded and tongued to frame as before.

ft.	in.	ft.	in.		
25	9				
	4½	9	8		¾in. deal, wrot. and moulded grounds.
25	9	25	9		Deal 3in. moulded architrave as before.
11	0	11	0		4in. by 2in. deal moulding as before on transom.
					2. Ends fitted, &c.
2	3	10	7	8	Deal grounds moulded, both edges 4in.
2	2	4	4	8	wide.
					8. Ends fitted, &c.
	3	10	3	10	Grounds as last, but 10in. wide.
	2	4	2	4	
					4. Ends fitted.
2	3	10	7	8	Architrave as before.
2	2	4	4	8	
					8. Ends fitted.
12	5				1½in. wrot. and rounded window-board as before.
					2. Mitred and returned rounded ends to do.
					2. Notchings.
12	5	12	5		Deal moulding, planted on under window-boards.
					2. Mitred and returned moulded end to do.
8	2	6	20	0	Groove in oak for window board.
4	2	2	1	16	8 Smith's or other approved water bar.
	24	7			
		4	8	2	s.s. and 2ce varnish.
25	9				
1	0	25	9		Add on architrave.
11	0				
	8	7	4		Add on moulding.
2	3	10			
	1	0	7	8	
2	2	4			
	1	0	4	8	Add on architrave, &c.
	3	10			
	1	4	5	1	
	2	0			
	1	4	2	8	
12	5				
	1	6	18	8	Add on window nosing, &c.
10	9				
6	8	71	8		1½ B. in mortar ddt.
12	10				Ddt. extra to Kentish rag facing as
6	6	83	5		before.
11	1				
6	11	76	8		Ddt. R.F. and S. walls and 2ce distemper.
13	5				
6	11				
	4½	25	1		Fir lintel.
					6. Wood fixing.
13	5	13	5		Extra to rough relieving arch as before, 4½in. soffit.
					12. Fir fixing slips.
					18. Lead plugs and running as before.

SANITARY CONGRESS AT WORCESTER.

THE eleventh annual congress of the Sanitary Institute is being held at Worcester this week in association with a health exhibition which will remain open until the 19th prox. The proceedings commenced on Tuesday, when, after a reception by the Mayor of the city at the Guildhall, and the award of prizes to successful exhibitors, the presidential address was delivered by Mr. George W. Hastings, M.P., who dwelt upon the necessity of proper appliances for the disposal of sewage. He was strongly in favour of placing the liquid sewage on the land directly, and he instanced Reading as a town which, by means of a well adapted sewage farm, disposed of the whole of its refuse without further trouble. Associated with this subject was the necessity for looking after the construction of drains and sewers and all the requisite appliances. Excellent work was being done by the Plumbers' Company of London by examining and registering qualified employers and skilled workmen for the purpose. In connection with ventilation, he called attention to an exhibit, in the sanitary collection, of a reversible window, which would greatly facilitate ventilation and the cleaning of both sides from the interior, while it would obviate the present danger to life and limb. Another leading influence on health was that of occupation. There were too many trades in this country which tended to produce disease and to shorten the length of life. The beautiful porcelain manufacture in Worcester still occasioned, in some instances, danger to the health of those engaged in it; but he was glad to say that a great deal had been done, especially in the increased size and ventilation of the rooms, to lessen ill-health. It was the duty of the community, as well as of all employers, to remove the cause of unhealthiness in our industries. The adoption of the general principles of sanitation would improve our drainage, and remove other general causes of disease, but this would be to a great extent nugatory if industrial occupations were allowed to remain insanitary. The recent Local Government Act would give to County Councils new powers for preventing the pollution of rivers and

streams, and he trusted that these powers would be wisely availed of in the county of Worcester, as well as in the kingdom generally. It was useless to attempt to purify streams, if they were polluted by the neglect of the community. He earnestly hoped that Shropshire, Herefordshire, and Montgomeryshire might be induced to join in a common effort for the conservation of the water supply of two noble rivers. He expressed satisfaction at the enactment of a measure for the notification of infectious diseases. In seven Parliamentary Sessions we had seen provisions of this nature passed in a number of local Bills, until no less than four and a half millions of the population had been subject to them. There had been no complaint of the system; it had had an immense effect in diminishing the spread of zymotic disease, enabling medical officers of health to hear of the first outbreak, and to take prompt measures for its suppression. Notification had now, by the recent Act, been made compulsory in the Metropolis. It now, therefore, extended over more than eight millions of population; and, while it was good for so large a proportion of people, it must surely be good for the whole.

A PROJECTED CHANNEL BRIDGE.

THE proposed Channel Bridge Scheme of MM. Schneider and Hersent, whose paper read on this imposing project before the Iron and Steel Institute in Paris created some discussion, hardly comes as a surprise after such accomplished engineering enterprises as the Forth Bridge and the Eiffel Tower. Is the proposal dictated by youthful audacity, as the president hinted, or by a matured mind? The idea at least is not new. The proposed design by MM. Schneider and Herseut is to construct a steel bridge stretching over the shallowest part of the Channel, commencing at a point near Cape Gris Nez, passing over the Colbart and Varne banks, and terminating near Folkestone. As regards the depth necessary to reach a foundation, it is affirmed that this varies from 29 mètres to 55 mètres (94ft. to 178ft.), which latter depth is about midway. The experiments lately made in the Channel have shown that a solid foundation can be found. The superstructure is designed to rest on piers, the distances between which are fixed at 500 and 300 mètres for the large spans, and 200 and 100 mètres for the small ones. The metal columns are round, and vary in height; there will be a free space for navigation varying in height from 61 and 63·78 mètres to 54 and 56·78 mètres at high water. The girders are to be unlatticed and trussed; there will be a double set of rails, and the width of the bridge will vary, the greatest width being 25 mètres, a width necessary to insure the stability of the structure against violent wind. The roadways are of the usual width of 15 mètres between axes and rails, the latter being placed in grooves to prevent accident. The floor is intended to be of ribbed sheet-iron. It is estimated that 1,000,000 tons of metal will be used, and that the cost of the bridge will be £34,000,000, each country to supply half the cost. The work is expected to take ten years to complete.

ASTON HALL, WARWICKSHIRE.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATION.]

THIS is one of the most famous and important houses of its style and period to be found in England, and although the building is better known than some others still in private occupation, the mansion has not been much illustrated; in fact, beyond the small key-sketch in Mr. Niven's admirable monograph of the hall, published a few years ago as a reissue from his "Old Warwickshire Houses" (printed in 1878), no general view of the entrance front, such as we give to-day, seems to have been hitherto printed in any architectural work. For the figuring of the plan accompanying this drawing we have relied chiefly on Mr. Niven's plate, and some of the following particulars of the house, descriptive of its history, are based on Richardson's "Old English Mansions" (1848), as well as the account furnished in the above-named folio. Richardson's work supplies a very good series of interior views, and a sketch of the garden front, with details of the staircases, &c., which are useful; and Mr. Niven furnishes other views representing the rooms as they are at the present time. Without attempting to trace the ownership of Aston before it came into the possession of the Holtes, who built the house as we see it, mention may be briefly made of Edwin, Earl of Mercia, who was Lord of Estone before the Conquest, when William the Norman bestowed the property on William FitzAusculf, whose castle was at Dudley, according to Dugdale. In the early days of King John, we read that William de Erdinton received the holding from Ralph Someri, who had himself received it through a female line from Ausculf. John Atte Holt, of Birmingham, was the earliest owner of Aston of that name, he having the place conveyed to him in 1367 by Maud de Grimsarwe. This worthy having no children, the estate was succeeded to by his uncle, Walter Atte Holte, and until the end of the last century this family continued in possession. The present mansion was commenced in 1618, when the park was inclosed by Sir Thomas Holte, whose building was sufficiently advanced for him to come into residence in 1631, though the house was not finished till four years afterwards. These particulars appear in the inscription cut in the panel below the pediment over the principal entrance to the hall, of which we give a detail, drawn by Mr. James W. Fisher, who published an outline perspective of it to a large scale in the "A. A. Sketch-book," Vol. X. plate 2. The main front faces the east, and the cours d'honneur is flanked by two falconers' lodges, which stand about 130ft. in front of the main building. The question as to who was the architect of Aston Hall is one to which authorities seem to have obtained no exact answer, though the honour appears to rest between Inigo Jones and John Thorpe. Mr. Wyatt Papworth, in his most useful little book for reference "The Renaissance and Italian Styles of Great Britain" (Batsford), apparently gives the preference in this case to "the skill of Marquis-would-be-Jones,* as a contemporary couplet describes the cathedral surveyor; but the authorship of the design is by no means clear. C. J. Richardson quotes the following houses, erected more or less by Inigo Jones, as a reason for determining that he designed Aston Hall, seeing that the buildings correspond very closely in some particulars in the order enumerated: Charlton House, Kent, built for Prince Henry in 1607-12. The west front was added afterwards by Sir Henry Knevitt. Walpole says only the great entrance-gates and colonnades. (In the Soane Museum there is a complete plan of Little Charlton, by John Thorpe.) Bramshill, Berks, erected for Prince Henry in 1607; Houghton Hall, Bedfordshire, designed for Countess Pembroke in 1615-21 (the porticoes are a copy of La Canta of Palladio), now in ruins; Dorfield Hall, Cheshire (1616), built by Ralph Wilbraham; and Crewe Hall, Cheshire, for Sir Randal Crewe, constructed between 1615-36. The staircase at this last house almost exactly corresponds with that at Aston Hall, and this, coupled with some other points of similarity, led Richardson to give it as his opinion that the two mansions and Dorfield Hall were by the same architect. We know that the original ground-plan of Crewe Hall, signed "I. J.," belonged, a few years ago, to Mr. I. W. Jones, of Nantwich. On the other hand, among Thorpe's drawings is a plan marked "For Sir Thomas Holt." This gentleman was famous for his loyalty, and in 1642 he entertained Charles I. at Aston Hall, one of the rooms being still known as the King's Chamber. The attack which followed his stay when the Royalists were marching from Shrewsbury to Banbury Castle is a familiar event in history. Sir Thomas outlived all his children with the exception of Grace, who married Sir Richard Shuckburgh. Holt died in 1654 at the age of eighty-three, and was buried at Aston with his ancestors. Sir Richard Holte, his grandson, succeeded him, and built the almshouses in the village. Through three more generations the estate passed from father to son, when Sir Lister Holte dying in 1770, was succeeded by his brother Charles, the Dowager Lady Holte occupying the Hall. The title became extinct on the death of Sir Charles in 1782, and the estates reverted to Heneage Legge, who resided at Aston after the death of Lady Holte in 1817. The furniture was sold by auction ("History of the Holtes of Aston," by Alfred Davidson, Birmingham, 1854), and the pictures were dispersed at prices quite beyond their value. In 1818 a banking firm at Warwick bought the hall and park. Amongst the subsequent tenants was James Watt, son of the famous engineer. In 1857 the Aston Park Company acquired the mansion and about 43 acres of the park, thus rescuing it from further appropriation as building plots. The Queen and the Prince Consort visited Aston the following year, and the hall and remnant of the park were inaugurated as a place of public recreation. The Corporation of Birmingham bought the property for this purpose seven years afterwards for £26,000 from the company, who became unable to complete the purchase themselves. Much of the detail of Aston Hall is thin and poor, showing a deterioration from the houses of Elizabeth's time; but its general design, like Cobham Hall, Kent (known to be, at least, partly the work of Inigo Jones), is undoubtedly effective, and in some part the work, though not so fine, reminds one of Blickling Hall, Norfolk, built at the same time by Sir Henry Hobart. The hall occupies the central portion of the house, and the appropriate disposition of the parts of the building is seen by the plan we print to-day. From the centre of the front and each of the wings rise towers, terminated with ogee-shaped roofs, that in the middle being carried on timbers—a questionable expedient adopted to prevent the base of the structure from interfering with the hall space below. Had the tower been brought forward in front of or above the entrance, the plan would have assumed the very usual form adopted at this period, when houses were often built in the form of a letter Π, and at the same time this objectionable piece of construction just alluded to would have been avoided. The hall is spoiled in effect and scale now through the place being occupied by some zoological specimens, such as a hippopotamus and a giraffe, whose ill-stuffed skins destroy the homely effect of the building. The hall ceiling is elaborated with panelled ornaments and badges introduced in patterns of geometrical design, enlivened with griffins, unicorns, lions, stags, and other quadrupeds, modelled in plaster in relief. Over the chimneypiece are the following lines:—

"If service be thy meane to thrive,
Thou must therein remaine
Both silent, faithful, just and true,
Content to take some paine.

"If love of virtue may allure,
Or hope of worldly gaine,
If feare of God may thee procure,
To serve doe not disdaine."

The staircase, of several short flights, leads to the first floor, having a scroll-work open balustrade, and arabesque enrichments are carved on the massive newels. The chapel, now denuded, but once filled with tapestry, and having an altar lighted by countless sconces, lies to the left hand, and over it is the great drawing-room, 39ft. by 23ft., and very lofty. A sumptuous chimneypiece rises to the cornice, and a deep frieze runs round the room, with men in Roman and Elizabethan armour wrought in bold relief. King Charles's bedroom is shown to the left, and to the right is Lady Holte's chamber. The gallery, said to have been added towards the close of the century, forms the great feature of the interior. It is 136ft. long by 18ft. wide, and 16ft. high, and is divided into thirteen bays by pilasters, with double-transomed windows between in five of these compartments. The chimneypiece, resting on caryatides, is very large and elaborate in marbles and alabaster in the upper part, above which are the shields and the bearings of the Holtes. The saloon is on the ground-floor at the back of the hall in the centre. The dining-room is placed to the right, and beyond, in the corner, is the yellow library. The other library occupies the far corner of this west front to the left, and the summer drawing-room divides it from the saloon. The colonnade room connects the library with the chapel. The curator's house is seen to the left beyond the chapel with the projecting porch, corresponding with that in front of the kitchen in the other wing, long bricked up. The stable court was situated to the right of the house, and on the north side of the house, next the stable yard, is the bowling green, put to its old use by the present day visitors.

* Sir Francis Kinaston's epigram on "St. Poules."

The pastoral staff for the diocese of Llandaff, illustrated in our issue of the 13th inst., was formally presented to Dr. Lewis, the Bishop, on Monday. It will be remembered that the staff was designed by Messrs. Kempson and Fowler; the sculpture and modelling are by Mr. H. H. Armistead, R.A., and the craftsmanship is by Messrs. Barkentin and Krall

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ILLUSTRATIONS.

EXETER CATHEDRAL—SOHO BAPTIST CHAPEL, SHAFTESBURY-AVENUE—HOLBOROUGH COURT, SNODLAND, KENT—ASTON HALL—PULPIT IN CROSCOMBE CHURCH, WELLS.—SKETCHES OF ARMOUR AND ARMS.

OUR LITHOGRAPHIC ILLUSTRATIONS.

EXETER CATHEDRAL NAVE, LOOKING EAST.

THE double-page interior view printed herewith is from a photograph by Mr. Harry Tolley, of Nottingham, whose studies alone constituted an entire exhibition early this year at the Camera Club, Bedford-street, Strand. Another of these "one man" photographic displays take place in the same galleries to-day, comprising some pictures by Mr. H. P. Robinson. We drew attention to the excellence of Mr. Tolley's work at the time, and are enabled to give a photo. tint representation of one specimen; but the extreme delicacy of the original silver print is naturally wanting to some extent in the ink impression. We have already published in our pages several illustrations of this great church, and a reference to them here may be useful:—Plan of precincts (by the late Rev. Mackenzie E. C. Walcot), Nov. 21, 1879; bay of nave, Oct. 23, 1875; south aisle (drawn by John Coney, 1820), Feb. 27, 1885; tomb of Bishop Walter Bronescombe (plan, section, elevation, and perspective, by Edward Keenor), April 11, 1884; screen to chapel in south transept (by Octavius Ralling), Jan. 23, 1885; twenty-four misereres to choir stalls (by Maurice B. Adams), Feb. 12, 1886, and the organ, March 2, 1882. No general view of the interior of the nave has been given till to-day. This shows clearly how the organ, built by John Loosemore in 1665, stands over the choir screen. When the cathedral was restored the two great towers of pipes which stood over the extremities of the screen against the piers were taken down and destroyed, it being considered by the authorities that they were obstructions to the view of the church. They were unusually fine specimens of tin, beautifully decorated with stamped enrichments like those of the great Tewkesbury organ*. The five pipes contained the lower notes of the double diapason, and were 34ft., with cornices surmounting them, like those which now adorn the centre case seen in the view. The following notes on the church give an outline of its history. Bishop Leofric, by a charter from Edward the Confessor, moved the episcopal chair from Crediton to Exeter. He was actuated, it is said, for one thing to do this partly for his own personal safety from pirates. A colony of monks were despatched to Westminster, and he removed at the same time a nunnery from the site of the present Deanery, Calenderhay. He then took steps to find a proper site for his new cathedral. Between 1112 and 1140 Bishop Warelwart, who was chaplain to William the Conqueror, commenced and carried on the work of the Norman building, of which the towers remain almost unaltered. The succeeding bishops proceeded with the work, and it is recorded that Bishop Marshall completed the Norman edifice before 1200. Of the commencement of the existing cathedral, so consistent an example of the Middle Pointed or Decorated style of Gothic, nothing very definite is known. Bronescombe partly erected the chapel south of the Lady-chapel; he deceased in 1280, and Quivil, who succeeded him, appears to have planned the entire structure as we now see it, erecting part of the nave and choir, and throwing open the north and south towers and transepts with vaulted coverings corresponding with those of the nave and choir. He formed two spacious windows in these transepts. Stapleton, consecrated in 1307, vaulted the eastern portion of the church, and himself gave £1,032 5s. 8d. to the cost of the work, whilst the dean and all the clergy were taxed to assist in the work. Grandison, who became bishop in 1327, erected the greater portion of the nave, and records remain of the cost of the Purbeck marble piers. The work was completed about 1350, and it is presumed that Grandison erected the rich western screen with the sixty-five statues of apostles and prophets, English and Saxon kings, which fill the niches; but antiquaries differ as to the personages represented. In the magnificent screen was built a small chapel dedicated to St. Radegund, and here was Grandison's sepulchre, the splendour of his shrine having been destroyed by Queen Elizabeth's Visitors. The bishop's throne in the choir is attributed to Bishop Bothe (1458); but from its style may be judged to date from more than a century earlier—was probably the work of Stapledon about 1310. It is a fine specimen of woodwork, its canopies and crocketed spires rising to a height of 54ft. The Chapter House, the lower portion of which was erected during Brewer's episcopate, is a good specimen of Early English work, whilst the upper part, with a range of Perpendicular windows and a gorgeous painted roof, do honour to the memory of Lacy and Nevyll, who completed them in 1450. The injuries done to the cathedral by Elizabeth, and also by the Puritans of the Commonwealth, are well known. Bishop Seth Ward restored the cathedral in 1662, and Sir Gilbert Scott renovated it about twenty years ago.

* Drawings of the patterns of these destroyed pipes are given in Hill's great book on Historic Organs.

SOHO BAPTIST CHAPEL AND SCHOOLS.

THIS chapel, recently completed, has been erected upon a freehold site in Shaftesbury-avenue in place of the old Soho Chapel in Oxford-street. The architect is Mr. W. Gillbee Scott, A.R.I.B.A., of 25, Bedford-row, London. The building is faced externally with red brick, all strings, diapers, &c., being in buff terracotta. The chapel rises to a height of 68ft. above Shaftesbury-avenue, and forms a conspicuous feature in this important thoroughfare. Internally the chapel is faced with yellow bricks relieved by bands, arches, and cornices of red brick, and with a dado of the same material. The roof is of open-timbered construction. It is boarded on the inside, and is 40ft. high from the floor of the chapel. There is a Bath-stone arcade behind the pulpit, and a gallery over the entrance end. The baptistery is raised 2ft. above the floor. It is a large galvanised iron tank, lined with white glazed bricks, and with white marble curb, steps, and foot walls. The windows are all glazed with lead light glazing. The whole of the internal fittings and joinery are of pitch-pine. All the staircases and approaches are of stone, and ample provision is made for easy entrance and exit. A large lecture hall or school room, 15ft. high, is provided under the chapel, and is amply lighted. Good class rooms, kitchen, pastor's, and deacon's vestries, a ladies' room and caretaker's rooms are also provided. Everything, from the foundation to the roof, is of the most solid and substantial character. The cost of the whole of the buildings, including heating and lighting, is about £5,800. The builder is Mr. W. Johnson, of Wandsworth Common. Mr. John Neville carried out the heating, Messrs. Strode and Co., of 48, Osnaburgh-street, N.W., the gas work, and Messrs. Jones and Willis the platform railing.

HOLBOROUGH COURT, SNODLAND, KENT.

No particulars of this building have been sent us by the architect.

ASTON HALL, WARWICKSHIRE.

FOR description see p. 417.

PULPIT, CROSCOMBE CHURCH, SOMERSET.

THE Jacobean woodwork of this church is, for completeness and richness, quite unique. We published a double-page measured drawing of the rood screen with a plan of the building in the BUILDING NEWS for July 26th last, and we give to-day a similar plate of Geometrical details of the pulpit with its great tester-sounding board. These drawings were awarded the Architectural Association Travelling Studentship this year, their author being Mr. Arthur E. Bartlett, of Wimbledon. An account of the church was printed when we published the screen. An exterior view and an interior perspective of the building will be found in the "Architectural Association Sketch Book" for 1888.

COMPETITIONS.

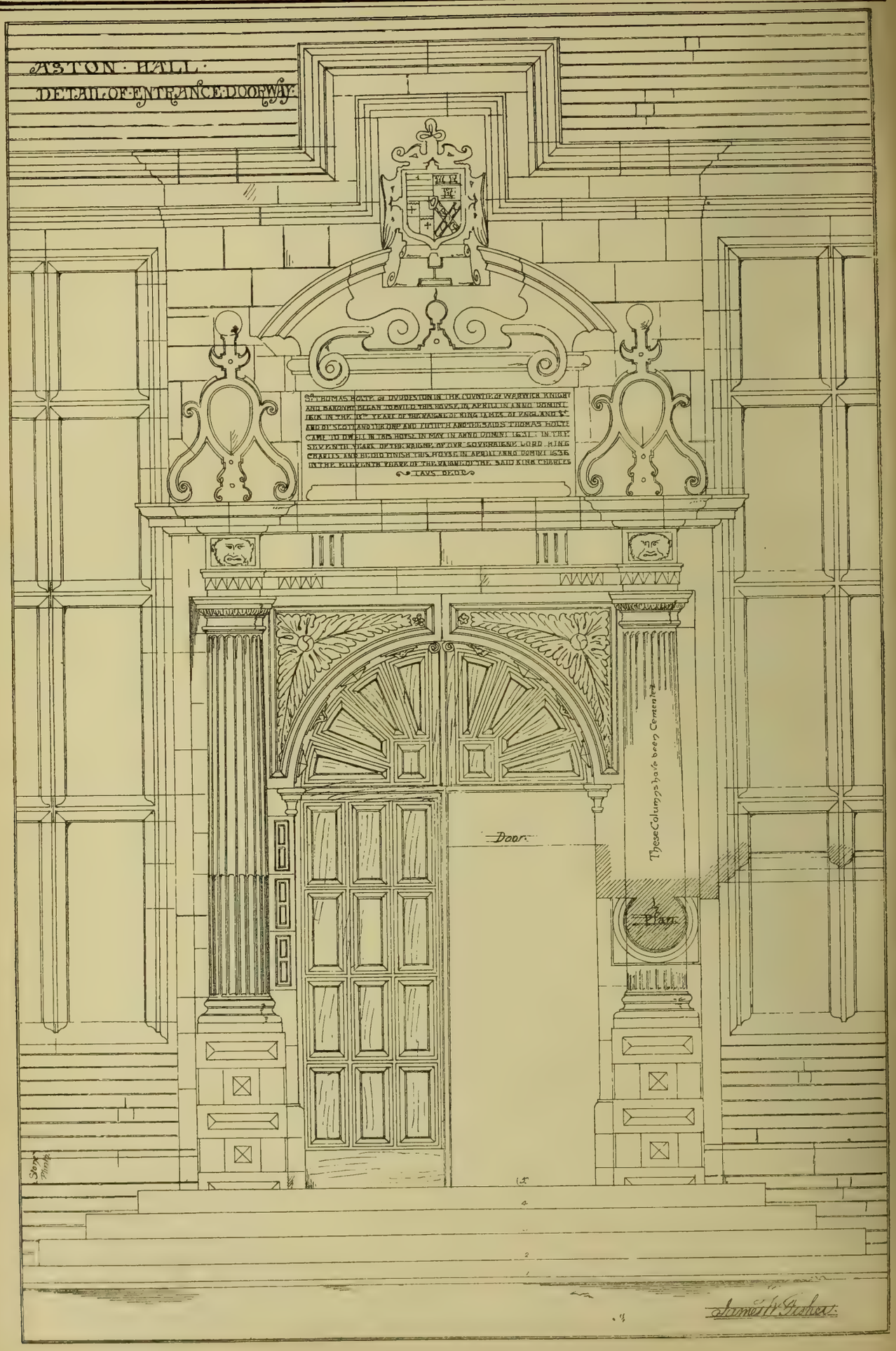
CLECKHEATON TOWN HALL.—A meeting of the Town Hall Committee was held on Friday to consider a report of a sub-committee appointed to examine the plans provisionally approved by the committee for the construction of the Town Hall. The plans in question have been prepared by Messrs. Mawson and Hudson, of Bradford. These plans having been approved by the committee, the remaining competing architects complained of unfair treatment, inasmuch as the stipulation of the trustees had been disregarded by Messrs. Mawson and Hudson. The committee having again reported in favour of the adoption of Messrs. Mawson and Hudson's scheme, the general committee thereupon decided to submit the plans to the local board, and, if the accommodation was satisfactory for the board's requirements, to ask the board to proceed with their application to the Local Government Board for the necessary borrowing powers for proceeding with the board's portion of the scheme.

GLOUCESTER MUNICIPAL BUILDINGS.—At a meeting of the City Council, held on Tuesday, the Municipal Buildings Committee recommended that the lowest tender received for the erection of the proposed new public offices (£19,300, by Messrs. Bowers and Co., Hereford, with certain allowances for material on the site) be accepted, subject to a proper contract being executed by the contractors. This gave rise to a lengthy discussion, the opponents of the project pointing out that the estimated cost was £5,000 more than the figures given by the architect (Mr. G. H. Hunt, London) as what his plan could be carried out for, and that with site, furnishing, &c., the project would cost £30,000, which would entail a 3d. rate for 30 years. The supporters of the scheme urged that the buildings were not only needed and essential for the proper conduct of civic business, but that their provision was expected of a city so large and important as Gloucester, to which they would be an ornament and a boon. On a division, the tender was accepted by 16 to 14. Application will be made to the Local Government Board for powers to raise the necessary money.

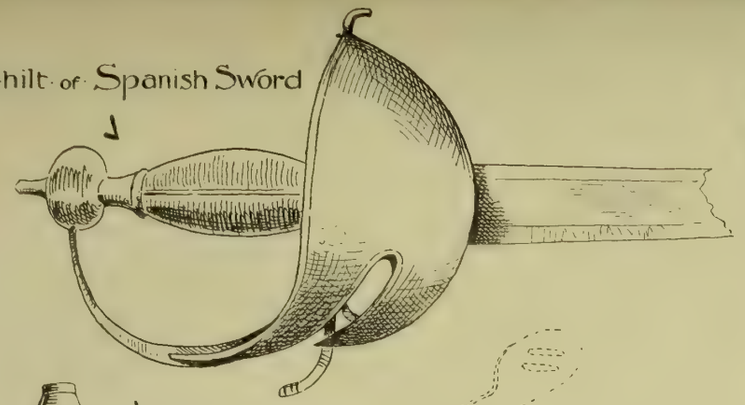
YORK BOARD SCHOOLS.—An adjourned meeting of the York School Board was held on Monday at the offices of the Board, Low Ousegate, where the designs of the competing architects were displayed. Mr. A. N. Bromley, F.R.I.B.A., the architect to the Nottingham School Board, was introduced, and reported on each design. He considered that all were more or less meritorious; but in five of the seven the playgrounds were cut up too much, and in one point or another did not give the advantages possessed by the designs "Light and Air" and "Economy I." He unhesitatingly gave the preference to the design "Light and Air." It was unanimously resolved—"That the Board approve of the plan named 'Light and Air.'" The envelopes marked with mottoes sent in by the seven competing architects were then opened. The names given under mottoes were:—"Light and Air," Messrs. Demaine and Brierley; "Economy I.," Messrs. Fisher and Hepper; "Lux," Mr. Charles Hornsey; "Light," Mr. G. H. Fowler Jones; "Economy II.," Messrs. Wm. Lewis and Son; "Spes," Mr. Edward Taylor; "Eton," Mr. Wm. Brown.

A large memorial clock has just been fixed in the church at Burwash, Sussex, to the late rector. It strikes the hours, chimes the quarters, and has two 5ft. dials. John Smith and Sons, Midland Clock Works, Derby, have carried out the work, and they guarantee the clock to keep time with great accuracy.

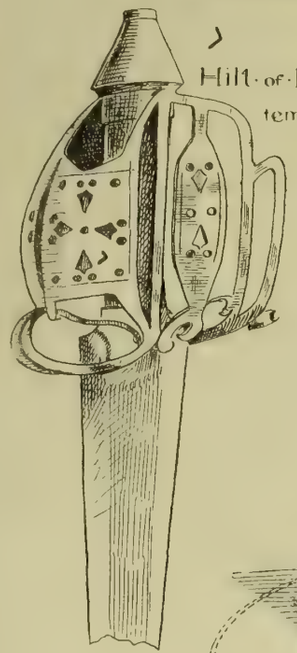
Bournemouth will not buy the town gas and waterworks. The price asked is £407,000. At a poll of the ratepayers 1,861 voted against the purchase, and 1,661 for it.


ASTON · HALL ·
DETAIL OF ENTRANCE DOORWAY
SR THOMAS HOWE OF DUDDESTON IN THE COUNTIE OF WARWICK KNIGHT AND BARONNE BEGAN TO VILD THIS HOVSE IN APRILL IN ANNO DOMINI 1618 IN THE 16TH YEARE OF THE RAIGNE OF KING IAMES OF ENGL AND SC AND BY SCOTLAND THE ONE AND FIFTIETH AND THE SAIDS THOMAS HOWE CAME TO DWELL IN THIS HOVSE IN MAY IN ANNO DOMINI 1631 IN THE SEVENTH YEARE OF THE RAIGNE OF OVR SOVERAIGNE LORD KING CHARLES AND HE DID FINISH THIS HOVSE IN APRILL ANNO DOMINI 1636 IN THE ELEVENTH YEARE OF THE RAIGNE OF THE SAID KING CHARLES
LAVS DEO
Door
These Columns have been Cemented
Plan
James W. Fisher

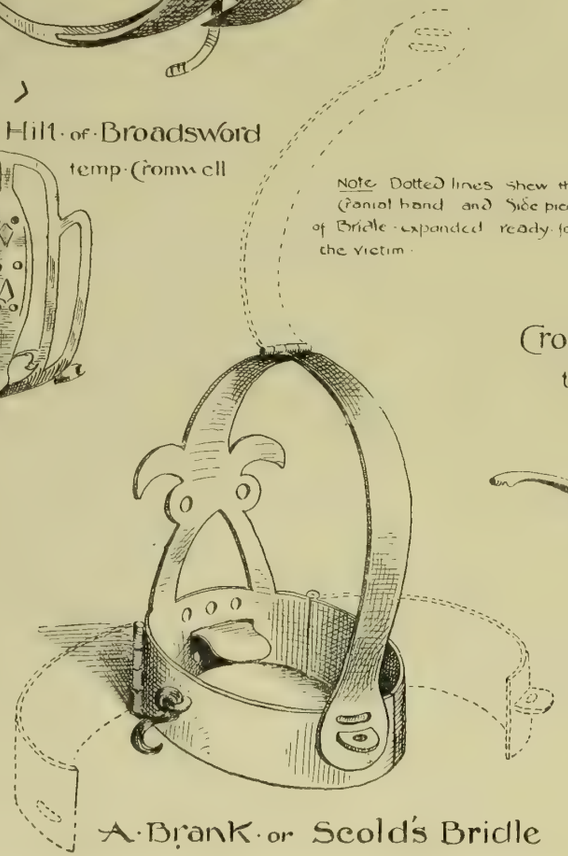
Sketches at a Recent Sale of Armour & Arms



Cup-hilt of Spanish Sword

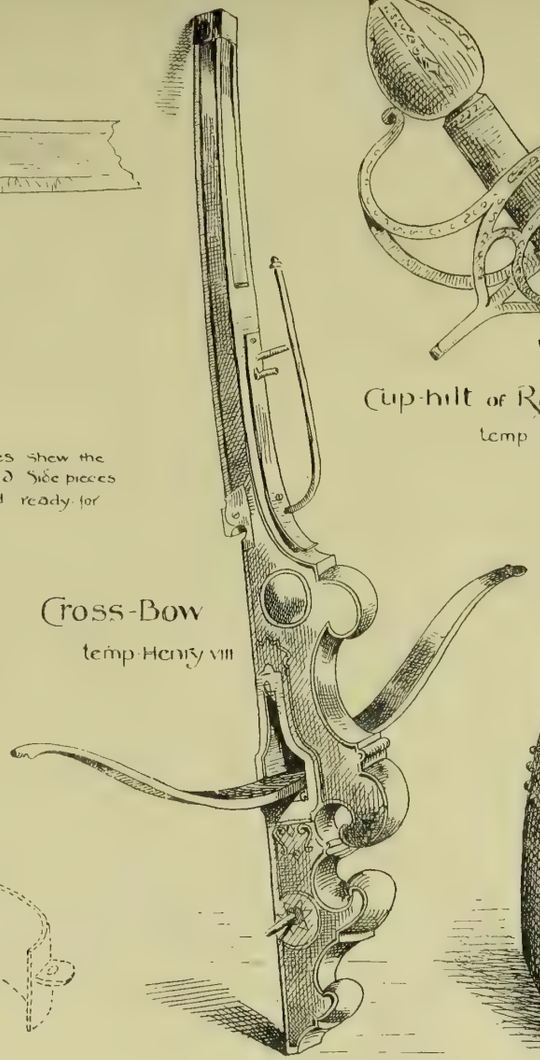


Hilt of Broadsword
temp Cromwell

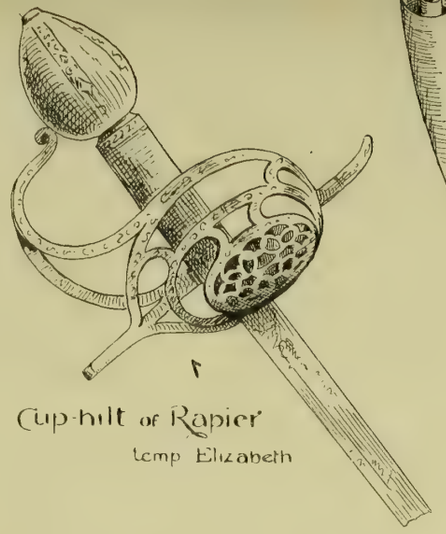


Note Dotted lines shew the Frontal band and Side pieces of Bridle expanded ready for the Victim

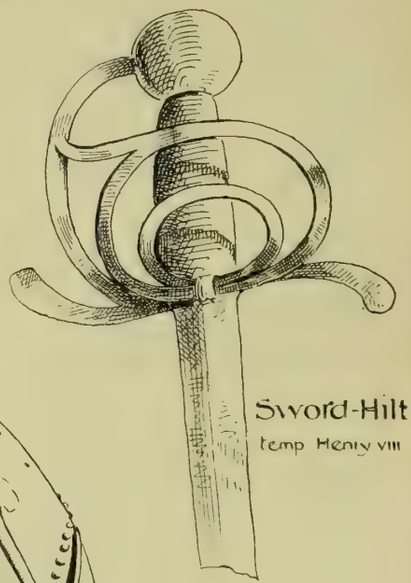
A Brank or Scold's Bridle



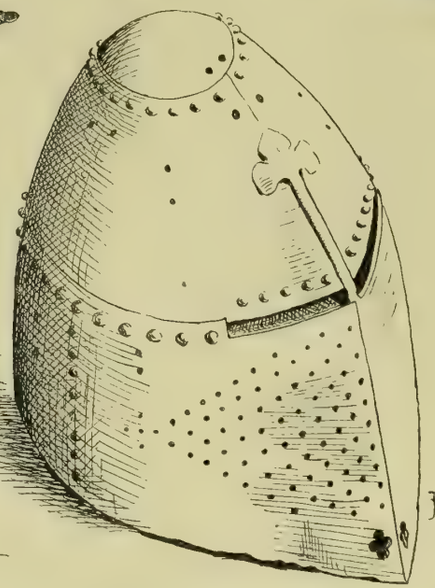
Cross-Bow
temp Henry VIII



Cup-hilt of Rapier
temp Elizabeth



Sword-Hilt
temp Henry VIII



A Heaulme
Said to be that of Sir Aylmer de Valence
from the Londesborough Collection

Chancellor Sc

SKETCHES AT A RECENT SALE OF ARMS AND ARMOUR.

WE give this week sketches of some very interesting objects from the Sale Rooms of Messrs. Christie, Manson, and Woods.

The Crossbow, of the time of Henry VIII., which forms the central figure in the sheet, is a beautiful piece of work, shaped with graceful curves. It is made of hard wood, and is very heavy. It measures 3ft. 3in. long, and is tipped with iron. The crosspiece, also of iron, is 2ft. 2in. from tip to tip. Considering its age, it is in a very good state of preservation. Its interest is undoubtedly great.

The Heaulme, of early date, is said to have been worn by Sir Aylmer de Valence; it was found at Denmey Abbey, near Cambridge. Sir Aylmer's widow, it may be remembered, founded Pembroke College. This object is from the Londesborough Collection.

Though not coming strictly under the title of arms and armour, we fancy the *Brank or Scold's Bridle* will be regarded with great interest. As its name implies, it was an instrument designed to inflict punishment on a garrulous and quarrelsome virago. Solomon said: "It is better to dwell in the corner of the housetop than with a brawling woman and in a wide house"; but though in his writings there are to be found many instances in which an unruly tongue is strongly declaimed against, still it is exceedingly doubtful whether he would have sanctioned the use of such a barbarous remedy as this. Our ancestors had rough ways with them, though we fancy even they must have received much provocation before they were driven to the extremity of devising such a punishment. Once originated, the use of branks seems to have grown into very general use, and their adoption was very prevalent during the 16th and 17th centuries, some having been used within comparatively recent times. There are still many extant—in provincial museums, &c.—of various forms and degrees of cruelty. The example illustrated to-day was formerly in use at Knutsford, in Cheshire, and is a mild form when compared with some really villainous types once in use, where the gag was spiked so as to lacerate the mouth, or was made so broad as to extend it in a painful manner. Although differing in minor points, most branks have a common arrangement as shown by sketch. This one consists of an elliptical ring, hinged on both sides, which encircled the lower jaw, and a hinged hoop connected therewith which passed over the head. In the front of the bridle this hoop is widened out, and a triangular aperture cut to allow for the nose, with two small holes on either side of the apex for the eyes. The gag for which all this framework was designed is a flat piece of iron, which was thrust into the mouth of the victim, and rested on the tongue, which it effectually silenced. Round this mouthpiece are six breathing holes. There is a slight attempt at allowing for the varying sizes of the heads, by means of two slots made in the tail of the head band, which would allow of a trifling adjustment. These slots pass over a loop, which could then be secured by means of a padlock. Thus, with the head incased in this severe engine, the unfortunate culprit was ignominiously paraded before the public eye, and received such insults and missiles as the populace chose to bestow.

In our issue for Feb. 2, 1883, page 125, a sketch was given of a very curious and elaborate "Mask of Correction" from Munich, and on May 18th of the same year there appeared a portion of an interesting lecture delivered at Reading by Mr. Joseph Stevens, entitled "Municipal Punishments of the Middle Ages," and accompanied by a lithographic sheet of illustrations. Amongst the latter are several sketches of branks, and the account of some of the forms for punishing social and domestic offenders is well worth perusal.

The Sword Hilts, of which we give sketches of four varieties of form, need little comment. The hilt of the Cromwellian Broadsword surmounted a fine blade inscribed "Abraham Stamm." The open cup-hilt (of English make) to the rapier was richly inlaid with silver, and is a fine example. The blade was long and narrow, and inscribed "Otho Tynn en Toledo." The sword hilt of the time of Henry VIII. bears a rough resemblance to the last named, which, being of the Elizabethan period, was probably but a refined development of it. The cup-hilt to Spanish sword is of good form, and for shielding the hand could not be well surpassed.

WAYSIDE NOTES.

IT was not to be supposed that the Americans would be outdone by any other nation either in the matter of exhibitions or Eiffel towers, and no one will feel surprise at the report that in 1892 New York is to dazzle the world with such a monster exhibition as will eclipse anything in this line hitherto attempted. The "Eiffel" tower—structures of this nature will, I suppose, in future be known as "Eiffel towers"—is to far outdo that at Paris, and will be a lofty erection even for the land of "sky-scrapers." The estimates of the committee for the exhibition are vast indeed:—Main building, 25 acres, £500,000; machinery hall, 20 acres, £400,000; agricultural hall, 10 acres, £150,000; horticultural hall, 5 acres, £90,000; and art buildings, 5 acres, £120,000. It appears, moreover, that the machinery hall is to be made a permanent building, in which case the sum of £400,000 will become £500,000, the extra one hundred thousand pounds being deducted from the cost of the main building. As to the "Eiffel" tower, that also is to "lick creation." The committee recommend that proposals be invited for erecting an "observatory tower" not less than one quarter of a mile in height. This will be just about 300ft. in excess of the tower at Paris. But the Americans ought to first assure themselves as to the nature of the tower proposed to be erected in London—the structure which Sir Edward Watkin—always burning to execute, or originate plans for the erection of, some gigantic work—proposes to father. I did hear that this tower was to attain an altitude of about 1,500ft., and if so the Yankees will have to try again before the desired "licking" of creation is attained.

There is to be some sort of a competition in connection with the New York exhibition; but even if it be international, it is not one that should tempt the English architect or engineer—not even those who have never learnt the extreme folly of having anything to do with competitions under the auspices of our friends on the other side of the Atlantic. This particular competition is, I believe, to do with the means of transporting visitors about the various portions of the exhibition, and liberal premiums are to be dispensed. For the design of the exhibition buildings I presume that some architect will be appointed, or has been appointed, as there is no announcement, or rumour even of a possible announcement, of a competition; and seeing that it would not affect us in any way, we shall not feel any burning curiosity on this point. As to the "Eiffel" tower, that will, apparently, be arranged on the competitive tendering system. M. Eiffel ought to have the job; but this wouldn't satisfy the Americans, who doubtless wish to do it all themselves. I fear, by the bye, that we are in for a reign of Eiffelism, and that three—one in Paris, London, and New York—will not be the sum total of these monsters destined to appear upon the face of the earth. And just one good word for M. Eiffel, whilst I think of it. Having made such a business of decrying his masterpiece, it is holden upon me to say what I am able in a contrary direction. It is this: that the tower at Paris is the result of a clear-headed application of common sense to the building of a modern Babel. An ordinary architect thinks of brick and stone when a tower has to be built, just as he did when the Crystal Palace was to be provided for the purposes of an exhibition. Sir Joseph Paxton came along with his glass and iron, and outdid architects in public estimation. M. Eiffel sees that iron is the most practical and economical material for building an enormously tall tower, and has achieved success in the same way as did the designer of the palace at Sydenham. Common sense was the watchword of both men.

It is a little strange that the Paris building has not been associated with the name of some layman—an individual outside the architectural or engineering professions; for strikingly original inventions rarely, if ever, come from professionals. Their minds travel in a rut; and to get one's mind out of a rut in matters of design and construction is a really difficult matter. Most original inventions have been made by outsiders, who go to work upon a problem with an open mind, and one unconstrained by habit, or that *use* which is second nature.

I have great pleasure in regarding the matter which is the subject of "Stonio the Stonecut ter's" letter to you in much the same light as he does himself. No architect, unless constrained by the demands of economy, would ever allow the practice to be adopted. "Stonio," I think, will find that where wrought stones come direct from the owner of quarries into a job, that job is a vastly inferior one, and architecture is prostituted to greed of gain. I remember a church tower being built where every moulding was cut, and, indeed, every necessary work in facing the stone was done at the quarries more than a hundred miles away. Not to mention the fact that the work was of the meanest and clumsiest description, I found that every now and then the men on the job were idle, and upon inquiry it turned out that the prepared sills, jambs, voussoirs, &c., were not forthcoming, those supplying the stone having failed to keep their promise as to the time the stone was to be at the works. I am wholly against the system of which "Stonio" complains. The stone should be worked upon the job, as it is when under the superintendence of any true architect. At the worst it should be worked at the yard of the contractor. In commercial "architecture" it does not much matter how the stones are worked; but where true architecture is being produced the mason must be under the eye of the architect. And to be conveniently under the eye of the architect, the stone must be brought in the rough to the job. The mason's yard must be under the shadow of the building, and the click of his tools must awaken its echoes. This is the only way to insure success in the masonic department. The system mentioned and bewailed by "Stonio" has to do with *building* as distinct from *architecture*.

The mountain has groaned, and all have gathered around. And, in very truth, a *mouse* has crept forth. After wasting a vast amount of your space, your correspondents Messrs. William Longmire and Co. have detailed the errors in the draughtsmanship of the "Sheet of Contracts." What are they? 1. Two old Norman windows are represented too close together. 2. The entrance door is too near turret. 3. The turrets are too near. 4. There is a thick line running through the upper portion of lancet window. 5. The sketch of south transept "shows the supposed old slype to reach nearly half-way up the front." 6. *The circular window in the north transept is drawn flat as an elevation;* and 7. *The buttresses on the south side are correctly drawn.* What a feeble show! Being away from town, I am unable to refer to the "contrasts" and compare Messrs. Longmire's statements; but I certainly object to believe that *right* is *wrong* because it is *right*, as your correspondent would have us believe in Nos. 6 and 7 "errors." Not having time now to go into the other questions in the St. Alban's Abbey discussion, or to refer to the intemperate, extraordinary (see statement about wrenching and smashing screens), and astounding assertions of your correspondents Messrs. Longmire, I must leave the subject for this week. Before concluding, however, I would point out that, in the eyes of the world, the charge of *liar* is sure evidence of an inability to prove one's assertions by straightforward and honest argument.

GOTH.

CHIPS.

The local authority for Market Harborough and Great and Little Bowden have adopted a scheme of water supply for the united district prepared by Mr. J. B. Everard, M.Inst.C.E., of Millstone-lane, Leicester.

The town council of Swansea have finally decided to invite tenders upon designs for the new Market by Messrs. J. B. Wilson and Glendinning Moxham, recently selected in competition, and should the lowest one by a responsible builder be below £17,000, the limit of cost, the designers will receive the sum of £50; if above, Messrs. Wilson and Moxham will simply be appointed architects at the usual remuneration. The architects estimate the cost at £16,800.

The parish church of Colton, near Ulverston, is about to be restored from plans prepared by Messrs. Settle and Farmer, of Ulverston.

A group of mission buildings are being commenced in Broad Plain, Bristol, for the Highbury Church, and will cost a little over £3,000. Messrs. Foster and Latrobe are the architects, and Mr. T. H. Brown, also of Bristol, is the contractor.

SCHOOL-BOARD CONTRACTS.

A FOURTH meeting of Metropolitan builders interested in the letting of the works of repairs and alterations of the London School Board was held on Tuesday night at Anderton's Hotel, Fleet-street. At the invitation of the meeting, several members of the School Board attended, including the Rev. Herbert Curtis, Mr. W. R. Bourke, Mr. B. Lucraft, Mr. Barnes, Mr. Hart, and Mr. Cook. Mr. Lawrence Stevens, L.C.C., as before, occupied the chair.

Mr. Lucraft said this taking of work from 143 builders and giving it to half a dozen was a ratepayers' question, quite as much, and more, than a builders' one. He felt thankful to the builders for the action they had taken, for they were stopping a very bad job. The few on the Board were getting all the power into their hands, and how were they doing it? By villifying those who had done the work of the Board well up to the present. Here was the commencement of a scheme similar to that which ruined the Metropolitan Board of Works. There was not the least doubt about it that the Board of Works for many years was pure; so were the first three School Boards for London; but the present one was going on to what brought the Board of Works to its final issue. The School Board was doing all it could to narrow the work to a few members of the Board. The publicity given this matter would, however, put a stop to a most gigantic fraud upon the ratepayers. This was not the whole of the scheme. It was intended, if this was successful, to have given the whole of the school building to half a dozen builders. He blamed the public a good deal for this, for listening to the specious statements which put cliques upon the Board; but he advised all at the next election to put practical working men on the Board to see that the work was properly done by skilful and fairly-paid men. Mr. Bourke said he strongly objected to such a sweeping alteration being made without the matter coming before the whole board. He remembered Mr. Helby (chairman of the Works Committee) saying to him, "We have passed it." "Passed what?" "Why, that which will doom open tendering." He (Mr. Bourke) said it was a wrong action, to which Mr. Helby replied that it was open to the meeting to have voted against it. Mr. Barnes said he had put a question to one of the large contractors who had been appointed to do work under schedule prices, whether he would be content to charge the quoted tenpence for repairing a lock? "Oh, yes," was the reply, "but there are other things, you know." Mr. Hart said he could not understand the action of the committee at all. As one of the Hackney members, he had been written to to nominate responsible firms for the repairing work of the schools—firms who, in his opinion, would do justice to the Board and the ratepayers. This he did, and no complaints were made of the work, and he was surprised that the same request had not been made to him again. He did not believe in throwing open the work to anybody who liked to tender, because he knew that some of the tenders were impossible prices for good work; but he did believe in good local men having local work. The Rev. Herbert Curtis said he was not on the Works Committee, and had not a chance of getting on it, though he tried. All these things were arranged by the chairman and vice-chairman for those whom they considered the most suitable men. Mr. Hart said the Works Committee were altogether too autocratic. They ought to be nailed down to their proper duties. Mr. Cook did not like the sweeping condemnation of his committee, but said he would always go for responsible local men, who paid fair wages, having a share of the work paid for by ratepayers' money. It was finally resolved that Messrs. Cook and Barnes be requested to present a memorial to the School Board, setting forth the injustices mentioned, and that the Board be asked to receive a deputation on the subject.

The Senatus of Aberdeen University some time ago, on the suggestion of Mr. George Reid, R.S.A., resolved to obtain a report from Dr. Rowand Anderson on proposed improvements of the chapel at King's College, Old Aberdeen. Dr. Anderson has now completed his report, and the estimated cost of the alterations is £3,000, the chief recommendations being panelling for the walls of chancel and west end, new tile and stone floor, stalls and oak screen, opening out of east windows, and decorations to walls and ceiling.

Building Intelligence.

ERYHOLME.—The parish church of Eryholme, near Gilling-on-Tees, North Riding, was re-opened on Tuesday week after restoration, on the basis (the *Northern Echo* states) of a report made by Mr. G. Gordon Hoskins, F.R.I.B.A., architect, Darlington, in the early part of last year. The edifice had suffered much from time, and possibly from past neglect. It was disfigured by rude rafters of timber supporting the roof, high-backed and most uncomfortable pews, and walls and pillars liberally covered with white-wash. The accumulated soil has been removed from the exterior of the walls, the interior of them and the pillars cleansed from the white-wash, a new roof put on, fresh windows put in, and open seats replace the unsightly pews. The outlay has been about £600.

HARTLEPOOL.—Wednesday was a gala day at Hartlepool, as the Marquis of Londonderry opened the Headland Protection Walls and Promenade, inaugurated the Henry Smith School, and dedicated to public use the extension of the hospital. The sea wall has been constructed at a cost of £25,000. It slopes in thickness from 11ft. at the bottom to 8ft. at the top; the height varies from 21ft. to 27ft; the length is 3,340ft.; and in it 40,000 tons of concrete have been used. It stretches from the lighthouse to the end of Corporation-road; and placing a broad-based wall in front of the crags that were irregularly worn, a magnificent promenade is provided, and three acres are added to the recreation ground of the borough. The coping of the wall has a railing of cast-iron stanchions and iron tubing fixed, as a protection. Mr. Howkins was the engineer-in-chief and Mr. William Belk the resident engineer. The Henry Smith School just built is a High school, well adapted for its purposes, and finely situated. The extension of the Hartlepools' Hospital includes new east and west wing. The west wing, which faces into Friar-street, comprises board-room, consulting-room, surgery, and waiting-room for out-patients. The east wing comprises one large ward measuring 50ft. by 19ft., and a smaller ward with accommodation for five beds, the nurses' duty room being arranged between the wards with view windows to each. Facing the principal entrance is the main staircase, 6ft. wide, giving an easy ascent to the first-floor corridor. This leads to the operating ward and accident ward, the latter containing five beds. Towards the east is a large ward with nurses' duty room attached, and to the south is another large ward for females, 66ft. by 90ft. A detached annex to all the wards, with intervening lobbies between, embraces lavatories, bath ward, sink, and w.c., lined out with glazed bricks. On the first floor are the house-surgeon's sitting and bedroom, kitchen, scullery, and the porter's room. In a detached block, and connected with the main building by a covered way, are the laundry, wash-house, drying closet, *post-mortem* room, and mortuary. All the wards are laid with polished hardwood flooring, the walls being coated with hard, polished cement plaster, and all the corners are rounded. Below the wood floors cement concrete is laid, to prevent damp air exhalations from the ground. No change is made in the architectural features of the exterior, the new portion being designed in character with the old. The cost of the whole is about £4,000. The contractor is Mr. Joseph Howe, Park-road, West Hartlepool, Mr. J. J. Wilson acting as clerk of works. The whole has been designed by Mr. Wm. Lister Newcombe, Pilgrim-street, Newcastle-upon-Tyne.

SOUTH SHORE, BLACKPOOL.—The Bishop of Manchester on Monday performed the ceremony of consecrating the new church at South Shore, Blackpool. The section now completed consists of the chancel and south chancel aisle. On the north are clergy and choir vestries, with the organ loft above. The transepts are each of two bays, taking in the three east bays of the nave. The chancel is raised above the level of the nave, and is separated from it by a stone screen wall. The side arches will be filled with open timber screens of ornamental character. The chancel floor is composed of black and white marble in geometrical patterns. The ceiling is vaulted with moulded ribs and carved bosses, in pitch-pine. The other ceilings throughout will also be in pitch-pine, with moulded ribs, ornamentally treated; but their completion has been deferred for the present on account of expense. The new building has been temporarily connected with the old, so that the whole can be used for service. The materials used are Yorkshire stone parpoints, with red Rainhill stone dressings, for the exterior. The cost of the present section has been £5,000. Messrs. Moore Bros., of Rawtenstall, are the contractors, and the architect is Mr. R. Knill Freeman, of Bolton, and Diocesan Chambers, Manchester.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

YORK ARCHITECTURAL ASSOCIATION. — On Saturday afternoon the members of this association visited the villages of Stillingfleet and Cawood, making their journey by water. Passing by Naburn *en route*, the new locks were inspected. The party proceeded as far as Stillingfleet landing, whence they walked to the village. The village of Stillingfleet is seven miles from York, being situated on the little river Fleet, and contains a remarkably fine parish church, which a few years ago was restored by Mr. Hodgson Fowler. At the church the party was met by the Rev. A. Ermiston, who explained its interesting features. The party walked on to Cawood, a distance of four miles. They first inspected the remains of the castle—once the abode of archiespicopal wealth and magnificence. The castle is stated to have been built by King Athelstan about the year 920. The church was afterwards visited.

CHIPS.

The new church at Clumber, just erected at a cost of £40,000 by the Duke of Newcastle, will be opened on Tuesday, October 22, by the Bishop of Southwell.

The unveiling of the monument erected at Pitlochry in memory of Dr. Duff, the first missionary sent to India by the Church of Scotland, took place on Saturday. The memorial is erected on an eminence directly to the east of Pitlochry Church. The cross is of the Scottish Celtic type, and is constructed of three blocks of red Peterhead granite. A bronze medallion of Dr. Duff, by Mr. Thomas Beattie, sculptor, Edinburgh, is inserted in the front. The cross was designed and executed by Alexander M'Donald and Co., Aberdeen.

The officials employed by Messrs. Forster, Brown, and Rees, of Cardiff, the engineers to the Vale of Glamorgan Railway Company, commenced staking out the route of the new line of railway on Monday, so that the carrying out of the contract for its construction may be proceeded with forthwith.

A large clock has been erected at Willenhall, Staffordshire, by John Smith and Sons, Derby. It has four large illuminated dials with automatic gas apparatus. It plays the Westminster quarters and strikes hours, and will undoubtedly prove a great boon to the town.

New assembly rooms have been erected at Salisbury, and special attention has been paid to the ventilation, the vitiated air being extracted by Messrs. Robert Boyle and Son's latest improved patent self-acting air-pump ventilator and fresh air admitted by their improved air inlets.

Last year the school at the Forest, Wallop, was enlarged at the sole cost of Mr. J. E. Severne, of Wallop Hall, who has lately built a new school house from plans by Mr. W. King-Brown. The walls are built of Sarn bricks with Grinshill freestone heads and sills, and the roofs are covered with Bangor slates. The work has been carried out by Mr. W. W. Southern, of Nobold, Shrewsbury.

The memorial stone of the Camlachie Institute in Great Eastern-road, Glasgow, was laid with Masonic ceremony on Saturday. The building will cost £3,500.

The chancel of St. Michael's Church, Handsworth, has recently been enriched by another stained-glass window. It consists of two main openings—the first having for its subject the widows showing St. Peter the coats and garments made by Dorcas; the other representing St. Peter kneeling by the bed side, having just restored Dorcas to life. They are surmounted by canopies formed of the vine ornament, with angels in madallions with bases to correspond, having texts and a memorial inscription. The work was executed by Messrs. Ward and Hughes, of Frith-street, Soho, London, who executed the other windows in the church.

The partnership, heretofore subsisting between Vernon-Pike and Tasker, of Chester-square, Pimlico, architects and surveyors, is announced to have been dissolved.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—J. D. and Co.—R. M.—M. B. L. B.—G. J. and Son—A. S. and S.—W. S.—P. P. and Co.—R. L.

Correspondence.

ST. ALBAN'S ABBEY.

To the Editor of the BUILDING NEWS.

SIR,—I inclose a copy of a petition against the continuance of Lord Grimthorpe's destructive and constructive works at the above, which has already received numerous signatures. I shall be happy to receive the names of any of your readers who may wish to join in this protest, and will gladly send forms to any who may be willing to obtain signatures.—I am, &c.,

HUGH ROUMIEU GOUGH.

12, Carlton Chambers, Regent-street, S.W., Sept. 23.

To the Right Reverend the Lord Bishop of St. Alban's, the Venerable Archdeacon Lawrance, Rector, and the Churchwardens of the Cathedral Church of St. Alban, Hertfordshire.

This Memorial and Petition Sheweth—

1. That your Memorialists are informed that a Faculty was granted in 1880 to Sir Edmund Beckett, now Lord Grimthorpe, empowering him to rebuild the West Front of the Cathedral in accordance with a design deposited in the Diocesan Registry, and to insert windows in some or all of the dark bays of the Nave, similar to those in the bays which have windows, and to restore, repair, and refit the said Cathedral.

2. That in the opinion of many of your Memorialists, Lord Grimthorpe has far exceeded the powers conveyed to him by Faculty, inasmuch as he has utterly destroyed a very large portion of the North and South Transepts, and instead of restoring and repairing them, has erected in their stead other work of a totally different character, and this, to the best of their information and belief, without submitting any designs or obtaining any permission for the same from the Consistory Court, or affording the Parishioners any opportunity of being heard in respect thereof.

3. That Lord Grimthorpe is now causing the windows of the Presbytery to be destroyed, and instead of repairing or restoring them, is inserting others of a different character of his own invention.

4. That your Memorialists, whilst fully recognising Lord Grimthorpe's liberality in providing funds for the works he has carried out, are pained and grieved at the nature of the same, whereby one after another of the most valuable and interesting features of the once noble Abbey Church have been so shamefully obliterated and destroyed, and it is with feelings of intense indignation, horror, and dismay that they view the same—feelings which they believe are shared in, not only by the vast majority of the parishioners, but by well nigh all archaeologists, antiquaries, ecclesiologists, and architects.

Your Memorialists, considering the fate which has already befallen the church to be a national misfortune and disgrace, therefore pray you as Guardians of this venerable fabric, to exercise your authority and take such action as you may think proper to stay the hand of Lord Grimthorpe, and to preserve what remains of the ancient building, so dear to English Churchmen, from further destruction, and your Memorialists will ever pray, &c.

Name.	Title or Occupation.	Address.

GRIMTHORPEISM IN THE NORTH.

SIR,—Having heard that someone had something to say respecting Eryholme Church, we turned to your Correspondence Column, and, on reading the letter of "Archæologist," our feeling was one of the profoundest regret and disappointment that we had never heard before of one who takes such an evident interest in that poor little church, though apparently hailing from the immediate neighbourhood. What a pity that "Archæologist's" naturally retiring nature and unwillingness to obtrude himself on others should have robbed us of all that long-matured knowledge and skill to which, both as an architect and as an archæologist, he lays claim! For what a man of wisdom he must be, how keen his eyesight! For, not having been in the church before its so-called destruction, he knows from a photo. its every detail, and sees in that photo. apparently columns which the eye of the photographic lens that took such a picture could not see. How strange to know these details so well, without even going into the church! We are puzzled as we think of it. But why need we be?—for nothing can be too hard to such a mind as his. We cannot but grieve when we think what we have lost. What might we not have had! Under "Archæologist's" magic hand exterior masonry, only a "*little* weather worn," would have grown sound again, split mullions and cracked headstones have re-united themselves, the roof would not have been poor and flimsy, nor the varnish treacly. But as we pondered over his words, a change came o'er the spirit of our dream; we began to ask, Had we, after all, lost so much as we first thought? For one question we would ask, What can be the matter with "Archæologist's" hair? "The screen," he says, "will make anyone's hair stand on end," and as he knows this will be the result with other people's hair, we conclude he has experienced this effect in his own person. Surely his hair must be very lively, for this screen is an exact copy of the old screen, which as an archæologist he should have loved, and his soul delighted in, for of course he saw the old screen in the photo.; but perhaps he thought we worthy individuals had destroyed the old screen, and did not mean to replace it, and perhaps it was the sudden sight of a screen so like the one in the photo., which came as a shock to him and caused his hair to rise! Would it not have been wiser had "Archæologist" waited until the work was finished before delivering his soul through the medium of your columns? But then he would have lost the amusement of seeing the corbels in the nave as yet without their struts. As to his remarks about breaking out for new windows in old walls, let us say that the restoration has been carried out on the basis of a report drawn up by an architect of very high standing, and that this item was particularly recommended by him. As to his remarks about pulling out two windows in red sandstone, the fact is that only one of the two he mentions was in red sandstone, and the headstone of that one was broken quite through, and also the mullion was cracked from top to bottom; yet he says they were only a little weather worn. Not much reliability can be placed on statements so inaccurate, and this applies also to his remarks on some of the interior work. He speaks of a trained eye: this trained eye has not helped him to distinguish what is newly done from what is old; for work that is new he overlooks as if it had not been touched, and portions that have not been touched he speaks of as having been rebuilt. But, last of all, and we ask your readers to consider this. How shall we say it, O, ye archæologists and architects? What shall we think, and what will you think, of the trained eye which, when it sees the semicircular arches of the arcade, distorts them into elliptical arches? Truly "Archæologist," in one respect, is like that old arcade—he is very bold. Semicircular arches appear to him elliptical—and he will have it so;—yet we facy that, in spite of his minute knowledge and discrimination, those arches will still remain semicircular. "Archæologist" informs us that his object was to show how a church can be mauled and ruined by those who have not his knowledge and discrimination. Would it not be nearer the mark to say that his object would seem to have been, in his charity, to find as much fault as possible?—I am, &c..

A WORTHY INDIVIDUAL.

ARCHITECTURE IN NORFOLK.

SIR, — Your correspondent "One on the Broads," calls attention to the very remarkable rood-screen in the church at Ranworth, near Norwich. This screen formed the subject of a publication by the Norfork and Norwich Archæological Society in the year 1867, containing a complete series of drawings of the screen and paintings—one panel only, however, in colour. When I last visited the church a few years back, the building was sadly in want of repair; but it is to be hoped that the screen will have been more carefully preserved, as it is deservedly considered the finest example in Norfolk, including those at Fritton and Barton Turf.—I am, &c.,

FRANK M. ELGOOD, A.R.I.B.A.

98, Wimpole-street, W., September 24.

[If Mr. Elgood possesses the publication referred to, and would trace some of the drawings he describes, or lend it, we are sure it would interest many readers.—ED.]

WORKING STONE ON THE JOB.

SIR,—In the early part of 1887 I had to defend in the columns of your contemporary, the *Builder*, an attack upon "Quarry Worked Stone," which was thrashed out until the editor closed the correspondence, adding in his "notes" "We believe that the remarks of 'A Quarry Owner' (myself) are in the main correct. The principal cause of quarry-worked stone being cheaper than when it is elsewhere worked, is the saving of carriage, of waste material, bad blocks, &c."

Now, in your valuable paper another attack has been made upon it (see "Stonio the Stonecutter's" letter in your last issue), and with your permission I should like to as correctly and decisively put the matter right, as I had to do upon the last occasion, although may-be he was not then engaged in the correspondence.

"Stonio the Stonecutter" implores the "aid of 'Goth's' racy and powerful pen to discourage the practice . . . of employing outside labour—i.e., quarry labour—in the working of stone used in our buildings," adding how easy it would be for architects to render to masons "an invaluable service by inserting a clause in their contracts to enforce the working of stone on the job, or in the yard, under the architect's own supervision."

It will not be denied that architects generally are very busy gentlemen, with their hands quite full, and their time fully occupied. Hence, if they can be spared the time and necessity of supervising the working of the stone on the job, they will gladly be rid of such necessity. And would it not be more becoming and straightforward of "Stonio the Stonecutter," and all others who are not employers of quarry labour, to do as we at the quarries do—viz., put in the best material (most durable, sound, and seasoned), carry out each detail accurately, and finish everything in the best style? Then the "necessity" quoted is entirely removed, and architects can rely with implicit confidence on their wishes being carried out to the utmost.

Without going into your correspondent's side of the question—which I can do fully if need be—my desire is to show, by quoting my own success with "quarry-worked stone," that it is the best thing architects can do to have their stone worked at the quarries. Take the first job I did after commencing business. I was much gratified to have a letter direct from the architect, whom I had never before had the remotest dealings with, quite unsolicited, saying—"The stones you have so far delivered do you great credit, showing great care, accuracy, and finish." And since this I have had several other jobs under the same architect, in three instances having the work placed in my hands to be worked at the

quarry, away from all supervision, at higher prices than the work could have been had at and executed close by his office, and under his supervision; exhibiting the total confidence in the one, and the want of same in the other.

Again, some years since I carried out some work under a builder, and away from "supervision." This so pleased the architect and his clients (and the builder, doing his work under "supervision," so displeased them all), that when another occasion arose the builder was passed by, and the work given me direct, which has again been repeated recently, being clear evidence of confidence in me and my work.

Another instance I may mention, where the architect and all concerned were so pleased with my work, that, although he has a clause in his specification that the stone is to be worked under his eye, or where he may readily see it whilst working, if desired, the builder adds that if I do the work the clause will not be enforced, showing the architect's confidence in my work.

Take another case, where I supplied the masonry, under one of the leading London architects: the testimony was, "I have great pleasure in informing you the work came together extremely well—in fact, I may say that in an experience of 25 years . . . I have never seen mouldings worked in Portland stone that intersected better."

And in one of my latest, the builder wrote me saying, " . . . The prejudice has been very great against quarry-worked stone, and it will be a triumph for you if you remove it, which I think you will."

I might go on multiplying these instances unto weariness, and am prepared to quote the names of the architects, builders, and name of every job I have done—all worked at the quarries—being many hundreds, so that any person may make the fullest inquiry or inspection, to see and hear the result of my labours themselves.

It is obvious to everyone that this course is best. First, because when a builder, or a mason under same, has a job to do in any stone, they will have the softest (and consequently, the most cheaply-worked and less durable of its kind), that can be obtained, knowing that if it fails, the stone, and not themselves, will receive the blame; and if another stone is specified for the next building it is no matter to them: they have to work that other stone, and they make as much from one as the other. But with the quarry-owner it is different. His first aim is to select the most suitable and durable stone, then finish it off in the best manner, so that the architect is pleased; the stone stands all weathers, he obtains credit for it, the stone is used again, and thus he obtains his living; whereas, being dependent upon that one class of stone, if he did anything whereby he brought discredit upon him or his stone, his living is immediately doomed, and he cuts the ground from under his feet. Then, secondly, because when he has any masonry to do, he has all the hosts of prejudices, and scrutinies, and devices to get through. First, the builder's foreman is prejudiced (or if a mason, perhaps riled that he has not the work being done under him in his yard), and he does his best to find fault. I don't mean wrongly to find fault; but he thoroughly well scrutinises it, taking care it is all right, and, as an honest man, seeing that as his master pays for a supposed good thing, he gets it. Then, thirdly, the builder is particular to see it is quite satisfactory, and that he gets the best for his money. Again, fourthly, the clerk of works comes in with his scrutiny (perhaps prejudiced also), and finally the architect.

In conclusion, the architect, if he be not quite so well versed in the various stones as most are, by having stone worked at the *quarries*, is sure of having that sort of stone used which he specifies, and not Red Dumfries used where Red Mansfield is specified, or the softest kinds of Bath and York, where the harder kinds are directed to be used—such, as it is rumoured, has been the case; in one instance it being carried so far as, in the words of a London mason, Corsham stone, *stained red*, was put into a building where a red stone was specified and *paid for!*

Trusting I may not have to resist further attacks—I am, &c., A Quarry Owner.

RE-PAVING OF THE STRAND.

Sir,—The vehicular traffic of this important thoroughfare having resumed its wonted aspect, and a great deal having been written and said during the execution of this work reflecting upon the vestry, its officials, and others concerned, I shall be glad if you will afford me the opportunity of stating a few facts in relation thereto.

The taking up of the old wood paving was commenced on the 12th ult.—a period of the year most suitable for carrying out such work, as being least liable to interfere with business and the interests of the ratepayers. On the following day notice was received from the Metropolitan Electric Supply Company of their intention to lay a main, with transverse branches about every 50ft. apart, under the portion maintained by this vestry, and the vestry having waived many formalities in order to expedite the carrying out of the work, the company proceeded with all expedition. This, of course, necessitated the suspension of the repaving for some days to allow the company to get ahead.

Simultaneously, Messrs. Gatti, by permission of the vestry, were laying a main between Villiers-street and the Adelphi Theatre, and subsequently between the Adelphi Theatre and Exeter-street.

The work performed in laying these mains was first to cut through a layer of asphalte 1in. thick, then concrete from 6in. to 12in. thick, excavating to a depth, in some cases, of 7ft., and having to contend with difficulties which only those who are acquainted with such matters can appreciate—viz., 25 pipes, varying from 24in. to 6in. in diameter, with services and branches, which exist in this thoroughfare from front to front. During this portion of the work about 200 men were employed. Beyond the work of the Electric Company, the gas and water companies made numerous openings.

It will be apparent to any experienced person that, with two electric mains being laid, and under the circumstances alluded to, the censure and complaints that have been prominent in many of the papers were made without a knowledge of the facts of the case. The making good of these trenches, amounting in length to 3,724ft, or about 1,010 super. yards, caused further delay, owing to the new concrete having to remain some time before being paved over. As a part of the difficulty, the Dock strike seriously affected us, the contractor for wood blocks (Mr. J. Knights) having been put to great difficulty in supplying us. Nothwithstanding these difficulties, the works have been completed within five weeks. The wood used between Charing Cross and Exeter-street has been the best yellow deal, in blocks 3in. by 9in. by 6in., of a superior quality, and unsurpassed by any laid in the thoroughfares of London; and between Exeter-street and Exeter Hall with Jarrah wood (Australian), 3in. by 9in. by 5in.

An architect, Mr. Emden, has suggested that a subway be constructed for laying the mains and pipes in (I trust he does not think this idea at all original, as the Metropolitan Board have formed subways in all their new streets for the past 30 years); but I should like to see how he would put this theory into practice in the Strand. I beg to supply him with the following particulars, to enable him to work out the problem. The crown of the sewer does not exceed in any part 10ft. below the level of the roadway, and there are between curb and curb 17 gas, water, and other pipes, and hundreds of service pipes, lying in many cases at a depth of 7ft.

With reference to working by night I have but little faith, as oftentimes the greater portion of the work so performed by an imperfect light has been undone the next day.

It has come to my knowledge that Mr. Emden has stated that, owing to his interference, this vestry have laid the Jarrah wood at the east end of the Strand; this I am prepared absolutely to deny, inasmuch as the vestry at the time of considering the question of repaving, some months since, resolved that this wood should be laid as an experiment between Exeter-street and the *Globe* office.—I am, &c., Henry Jacques,

Surveyor to the Vestry.

Vestry Hall, St. Martin's-place, W.C.,
Sept. 20.

[Mr. Walter Emden has replied at considerable length. He still holds that the deal blocks should have been prepared with creosote, and should have been of a harder class of wood than yellow deal. He says that he did not attribute the use of Jarrah wood at the east end of the district to any interference on his part; but suggested that it would have been better to have made the experiment with the Jarrah wood at first, before doing the repaving. He still considers that the work might have been done by night as well as by day, and, while not claiming in any way the credit of originating the idea of subways, he believes that in the Strand it would be infinitely cheaper to put down subways—in laying which there would be no insurmountable difficulty—than to have the road constantly up for one company or the other.]

SCAFFOLDING.

Sir,—I was much interested in the article which appeared under this heading in your last week's issue, as I have carefully watched the subject for some time past.

To the best of my knowledge, the steam derrick crane, as applied in the erection of buildings, was first introduced into London by Messrs. MacGregor at the Army and Navy Hotel, Victoria-street, S.W., about seven years ago, and since then its adoption has been followed by many others, until it has now become tolerably general upon most buildings of any importance. To my mind, however, it is by no means clear whether it is an economical system or not, as, in cases of brick fronts requiring pointing, or, in fact, any elevation having much labour in its finishings, the derrick system does not seem to me supersede the ordinary scaffolding, which, in such cases, appears to be required just as usual. The conclusion, it seems to me, to point to is for ordinary buildings, having nothing special to lift beyond the ordinary bricks, timber, &c., the use of a steam derrick with its tripod staging would not be economical, but the reverse. In the case, however, of jobs where there is much heavy lifting, such as stone and ironwork, and where crabs and tackle would be largely used (the constant shifting and re-erection of which consumes a deal of time), I imagine that the steam derrick, commanding so large an area within its radius, must be of great service.

When first introduced into London it was watched with considerable interest, and was supposed by some to supersede all other scaffolding, the men working overhanded from the inside; but with the class of labour mostly expended upon elevations in London, that theory is an impossible one.

Doubtlessly, some of your many readers might be able to speak, with the authority gained by experience upon the economical aspect of the subject, and such information could not fail to be of practical interest to the trade, and it would also greatly oblige—Yours, &c.,

Sept. 25. London Builder.

NEWCASTLE SMOKE.

Sir,—It is devoutly to be wished that the remarks of Professor Oliver and yourself about the insanitary, wasteful, and inartistic effect of the pall of smoke which constantly overhangs the town of Newcastle and neighbourhood may lead to immediate remedial steps being taken. The first cause, however, of "the sooty black" buildings is the soft, porous stone of which they are constructed, and I will venture to recommend our friends in the north to do what is now becoming common in this southern city of fogs—viz., to build with a material capable of resisting the penetration of soot in rainy weather. The use of beautiful polished granite is becoming more common in smoky London year by year. Structures fifty years old are as clean and perfect as on the day they were finished. Every shower of rain cleans down their hard, impenetrable surfaces, and instead of "sooty blackness" we have perennial freshness; instead of the rapid decay of the limestone once in every-day use for the more important buildings, we have structures of everlasting durability. We have yet to adopt or create a style of architecture suited to the natural characteristics of the material; but the artistic genius of our countrymen will doubtless supply this at no distant date. We shall then build as cheaply with granite as with freestone.—I am, &c., H. T.

WASTE PIPES.

Sir,—In your journal of the 20th inst., in par. 85 of specification of "Practical Architecture," a "1¼in. warning-pipe" is specified for cistern.

Does not this smack of jerry-building, of which we now see so much?

A mere warning-pipe is a very inferior fitting to a standing waste-pipe with brass washer, waste, and waste-pipe discharging over a gully or sink; as this not only acts as a warning-pipe, but admits of the cistern being thoroughly

cleaned out without expense or inconvenience, whereas a cistern fitted with a mere warning-pipe can never be effectually cleaned, and any attempts to do so is attended with inconvenience and expense, as the dirt, water, &c., lying in the bottom of the cistern below the level of the top of the service-pipes has to be sopped up and bucketed (down-stairs in most cases), and the same process has to be repeated over and over again before the water used for cleaning the cistern can be removed. Indeed, the cleaning, and removal of all the dirty water is never done thoroughly.

A standing-waste and washer, &c., are as essential to health as any other sanitary fitting.—I am, &c. E. C. B.

CHIPS.

The long-contemplated improvements to St. Thomas's Church, Stourbridge, are about to be commenced, a contract having been entered into with Mr. North, builder, of Stourbridge. The work embraces a new semi-circular apsidal projection to the chancel, a new staircase wing to the north gallery, alterations to the entrances, vestries and seating, with other minor improvements. From lack of funds a part of the scheme has had to be abandoned for the present; but, it is hoped to eventually complete the whole according to the plans of the architects, Messrs. Cotton and Bidlake, of Birmingham. The church is a very interesting specimen of the Queen Anne type of English architecture, and the new additions are designed to strictly harmonise with it.

The ancient and very interesting church of Llantillio, Perthorley, near Abergavenny, is now being restored, Messrs. Kempson and Fowler, of Llandaff, being the architects, and Mr. John G. Thomas, of Abergavenny, the contractor.

Mr. Philip Wilkinson, late master of the Worshipful Company of Plumbers, will preside at Mr. Clarke's opening lecture to plumbers at the Polytechnic Y.M.C.I., on the 30th inst.

A new church to be dedicated to St. Peter is about to be built at Warrington from plans by Mr. Medland Taylor, of Manchester.

The joiners and carpenters of Greenock have asked their employers for an advance of a half-penny per hour on their present rate of wages.

The parish church of Bradninch, Devon, dedicated to St. Denys, has been restored, from the designs of Messrs. Hayward, Son, and Tait, architects, of Exeter, and Wednesday next, the 2nd prox., is fixed for its reopening. Among the new features in the edifice is a memorial pulpit in Beer stone, elaborately carved, and made at Mr. H. Hems's ecclesiastical art works from the designs of Mr. E. L. Parsons, of Exeter.

The first building to be erected by the County Council of Lancaster and the county magistrates is the county police-court and station, with offices, at Birkdale, on a site next the town hall. The result of the competition among architects is the selection of designs of Mr. William Verity, architect, of Wigan and Huyton, who will carry out the work.

A fresco has been placed in one of the wall panels of St. Margaret's Church, Burton-on-Trent, by Lord Burton, as a memorial to his father, the late Mr. M. T. Bass, M.P., who founded the church. Mr. G. F. Bodley, A.R.A., designed the fresco, which was carved by Messrs. Buckridge and Floyce, of London.

St. Margaret's parish church, Bagendon, near Cirencester, was reopened by the Bishop of Gloucester and Bristol on Thursday, the 19th inst., after restoration, effected at a cost of £500. The floor has been lowered to its ancient level, re-covered, and re-seated, and a new vestry and heating apparatus have been provided. Mr. Sidney Gambier-Parry was the architect, and Messrs. Kestall and Sons, of Bisley, near Stroud, the builders.

The Royal Archæological Institute will hold their annual meeting in 1890 at Gloucester, which city they last visited in 1860.

Colonel W. M. Ducat, R.E., held an inquiry at the local board offices, Baildon, last week, respecting an application made by the board for power to borrow £813 for sewage filtration works, and the sum of £2,000 with which to construct sewers. The works will be carried out from plans prepared by Messrs. Jagger and Turley, of Leeds.

New Sunday-schools for St. Chad's parish, Stafford, have just been completed in Tipping-street in that town. They accommodate 300 children, and have been built by Messrs. Adams and Pemberton.

Mr. Campion, who was elected as a town councillor for Southport in November, 1887, has resigned his seat, having been appointed inspector of buildings and drains, in the place of Mr. A. G. Wallis. The salary is but £100 a year.

Intercommunication.

QUESTIONS.

[10093.]—**Deodorising.**—Some 25 or 30 years ago a building was erected over a foundation or sump of bad-smelling stuff. A few years ago some 3ft. or 4ft. of this foundation was removed, and to all appearance no soil of a doubtful nature now remains which could cause any unpleasant odour. In addition to carefully ventilating the space under the ground floor, I am proposing to cover the surface with layers of charcoal and lime concrete. I shall be glad if any of your readers can inform me of any better method for deodorising the space between the ground surface and the solid floors of ground-floor rooms. —CAUTION.

[10094.]—**Projecting Eaves.**—A cottage erected about 8 years ago was built with the rain-water gutter projecting over an adjoining plot of ground. Could I remove the same at any time, whether wanting to build or not?—LANCASHIRE.

[10095.]—**Student's Lamp.**—I should be glad if any subscriber could give me the name and particulars of what they consider the best lamp for the use of an architectural student doing evening work. I find gas too trying for the eyes.—STUDENT.

[10096.]—**Measuring Modern Work.**—Is it, or is it not, honest to take measurements from buildings designed by architects still living? I ask this because whilst visiting a church (in a town on the west coast of Scotland) which is being restored by an English architect of some repute, I took the measurements of a few details, and have since wondered whether my action would be approved of by the profession. An opinion on this point, from some one who has done a quantity of good work, will be appreciated by—NORTHENER.

[10097.]—**Lear" Board or Layer Board.**—What is this in connection with a roof? Is it the same as eaves board at eaves and valley board at sides of valley gutters, both the latter being under the slates, and in the case of valley gutters covered with lead.—W.

[10098.]—**Clerk of Works.**—I shall be pleased if some kind brother will advise me, through the medium of your valuable paper, what steps to take to be fully equipped for Clerk of Works. I am 21 years old, having served six years at bench and office work in a good firm, and a sound knowledge, both theory and practical, of building construction, having passed the advanced stage of building construction, quick at figures, fair writer and draughtsman. What lack I yet, or what studies best for improvement?—H. B. A.

[10099.]—**Domestic Hot-Water Supply.**—Is anything gained by having the flow-pipe of 1in. bore from boiler to hot-water cistern, or cylinder, and the return-pipe ¾in. internal diameter?—TEACHABLE.

[10100.]—**Questionable Wood Flooring.**—I find straight-jointed boarding used for the flooring of good villa residences at Southport and Birkdale. Is not this jerry work, as the floors will allow of cold air to come up at the joints from questionable sources, besides permitting dirty water to trickle through chinks of boards on to moulded and enriched plaster ceilings below? Is there much saving in first cost in this class of flooring? In the Yorkshire town where I reside, even the commonest cottage floors are laid with tongued and jointed boards.—TOLOP.

[10101.]—**Crumbling Bath Stone.**—The windows &c., of my house are faced with Bath stone, which, though only ten years' old, is crumbling away. Is there any composition which can be applied which will stop the decay? My builder suggests three or four coats of paint; but that will change the look of the house, and I do not wish to resort to it if avoidable.—J. P.

[10102.]—**Architects' Charges.**—At the request of a client I have prepared preliminary sketches for proposed additions to his house, also a tracing of same for landlord, together with approximate estimate of cost. What would be a fair charge for this work only, taking into consideration my time measuring premises, interviews, and obtaining sanction of district surveyor to said alterations, which have now been abandoned?—MAVIS.

REPLIES.

[10062.]—**Destructors.**—For latest information on this question see "Report on the Destruction of Town's Refuse," by Thos. Codrington, C.E., Engineering Inspector of Local Government Board, published by Eyre and Spottiswoode, 1888, 1s. Also Vol. XIV. of "Proceedings Municipal and Sanitary Engineers," p. 19-79.—BOROUGH ENGINEER.

[10080.]—**Sooty Bricks.**—These, as "J. W. S." says, are a great source of trouble when used in walls, especially those which are papered or decorated. We can recommend, as the only radical cure, to remove the plaster and make a diligent search for the sooty bricks, cutting them out, and replastering and papering. You may try by covering the stained portions or patches with tinfoil or thin lead, and repaper. We have little faith in chemical solutions that would effectually destroy the evil.—G. H. G.

[10085.]—**Price of Stonework.**—I consider 5s. 6d. per foot cube a fair price for Box Ground stone. I have not noticed the building referred to. So much would depend upon the kind of stone used, of the relative proportions of plain work and moulded work. Elaborate brick fronts must be valued in detail: they cost about the same as stone.—H. L.

[10086.]—**Liability of One Trade, &c.**—If the architect has a proper contract, with specification, he can adjust the differences between the contractors.—H. L.

[10090.]—**School Closets.**—A "29½ Years' Subscriber" evidently means Adams and Co.'s Latrines, which I know from experience will give him satisfaction. Adams and Co., Monk Bridge, York, will send him a catalogue on application.—SCHOOL BOARD ARCHITECT.

[10090.]—**School Closet.**—Nothing can be better than enamelled stoneware trough set in concrete with an earthenware P-trap at the outlet. The flushing-tank is self-acting, and for four seats would contain 50 gallons. —H. L.

[10091.]—**Measuring Buildings.**—The best book for "Espere" is Mr. Leaning's, on Quantities. He should also study Mr. B. Fletcher's book, and follow from week to week "Practical Architecture" in the "B. N." It is impossible to learn quantity taking and measuring from books alone.—H. L.

CHIPS.

The Iowa Soldiers' Monument competition, of which, when in progress, we have given particulars, has been won by a woman, Mrs. Harriet A. Ketcham, of Mount Pleasant, Iowa; and the second prize has been awarded to Mr. Robert Kraus, sculptor, of Boston, Mass. The selected design is said to closely follow Rauch's monument to Frederick the Great at Berlin.

The Wrexham Town Council decided, on Tuesday, to raise the salary of the borough surveyor (Mr. J. W. M. Smith) from £175 to £200 per annum, in consideration of his services in connection with the sewage works and plans.

A drinking-fountain is being erected in the market-square at Dawlish, at the cost of a resident in the town. Messrs. Ellis and Painter are the contractors.

A new mission-church has been erected at Wimblebury as a chapel-of-ease to the Hednesford parish church. The building is Gothic in style, of red brick, with blue brick plinths. The windows have red brick arches, and the roof is covered with blue tiles. The room is 52ft. long by 23ft. wide. The chancel is divided from the main room by Attwood's revolving shutters when used as a day school. The building will seat about 200 persons. The architect is Mr. W. A. Bonney, of Rugeley, and the builder Mr. T. Mason, of Hednesford.

The parish church of Pill, Somerset, has just been lengthened by an addition to the west end, and a baptistery, porch, and choir vestry have been added. Mr. E. W. Barnes, of Bristol, was the architect, and Mr. W. Maggs, of Sodway, the general contractor. The carving was executed by Messrs. Davey and Bushell, St. Michael's Park, Bristol, and a stained-glass window by Messrs. J. Bell and Son, of the same city.

A bust of the late Mr. E. M. Dixon, head master of Allan Glen's School, Glasgow, by Mr. P. M'Gillivray, sculptor, was unveiled on Friday in the vestibule of the school.

The parish church of St. Michael, at Axmouth, is to be reopened by the Bishop of Exeter on Tuesday next, 1st October, after a renovation from the designs of Messrs. Hayward, Son, and Tait, architects, of Exeter. Axmouth Church is one of the oldest and most interesting in the county, its Norman south arcade and north doorway being well known to antiquarians. The work, which includes new roofs, containing much carved work, and the entire reseating of the church in English oak, has been carried out by Mr. H. Hems, of Exeter.

The Ven. Archdeacon Yeoman unveiled, on Friday, in the fine old Norman church at Salton, in Ryedale, a window inserted in memory of the late vicar, the late W. Abbey, M.A., who ministered in the parish for forty years. The new window has been inserted in the fine Early English tower of the church; it is of three lights, and was designed by Mr. Temple Moore, and executed by Mr. Victor Milner, of London.

At a meeting of the Lord Provost's Committee of the Edinburgh Town Council, held on Friday, it was resolved to recommend that the Privy Council should be petitioned for an inquiry as to the administration and application of the funds of the Royal Scottish Academy before the new charter asked by that body is granted.

Col. North has followed up his gift of the Cistercian Abbey ruins and adjoining grounds at Kirkstall to the people of Leeds, by acquiring Holbeck Manor as a public recreation ground. As to Kirkstall Abbey, a letter from the Society of Antiquaries was read at a meeting of the Corporate Property Committee of Leeds Corporation on Friday, offering the services of one of its members to advise as to the best means to be adopted to preserve the ruins. After discussing the matter, the committee decided to accept the offer.

A memorial pulpit to the late Mr. Downall is to be unveiled in All Saints Church at Okehampton at the harvest festival, on Sunday, the 6th prox. The pulpit is of carved oak, and is the work of Mr. H. Hems, Exeter, from a design by Mr. John Hayward, architect, of Exeter. The church stands in a commanding position about a mile outside Okehampton, and all, except its western tower, was rebuilt from Mr. Hayward's designs so long ago as 1842.

On Saturday the Bishop of Glasgow consecrated an addition to the chancel of St. Mary's Episcopal Church, Hamilton; and at the same time there was unveiled a memorial stained-glass window representing the Ascension.

Our Office Table.

ON Wednesday last the Town Council of Leicester unanimously appointed Mr. E. G. Mawbey, Assoc.M.Inst.C.E., city engineer and surveyor of York, to the important post of borough engineer and surveyor of that town, to succeed the eminent engineer, Mr. Joseph Gordon, whom we all know is now the chief engineer to the London County Council. There were forty-two candidates for the appointment, the commencing salary being £700 a-year. In the first instance seven candidates were selected—viz., Messrs. J. T. Barber, Islington; J. W. Brown, West Hartlepool; A. W. Harpur, Cardiff; J. Lobley, Hanley; C. Mason, Leicester; E. G. Mawbey, York; and R. Read, of Gloucester. A sub-committee, consisting of the mayor and five aldermen and councillors then visited the towns of the respective candidates, and on their report the whole committee selected for recommendation to the council Mr. Mawbey and Mr. Harpur. The sub-committee reported specially in favour of Mr. Mawbey, and also spoke in the highest terms of Mr. Harpur. Subsequently, Mr. Harpur withdrew from the contest, the Corporation of Cardiff agreeing to raise his salary at once to £700, and to £800 in the near future.

SOME who go sketching, particularly those who employ oil colours, may be interested in an improvement made in the form of boxes used on these occasions, so that the old-fashioned square flat case, at once so bulky and inconvenient to carry about, need no longer be used. The invention to which we refer has just been patented by Mr. Henry S. Farncombe, of Brighton. Its principle consists in rolling up the flat box, as it were, thus placing the colour tubes round a circle, so bringing the materials required for sketching into the most compact form and smallest compass. The cylinder for holding the colours revolves either backward or forwards, and is adjusted by a spring inside the box. It can be taken out and replaced at will. Inside the outer radius, which holds the colours, a compartment is made for the brushes, pencils, softener, and palette knife, the folding palette being placed at the bottom of the case. The general size of these new boxes is 8in. long by 3½in. in width, and is suspended from over the shoulder by a leathern strap. When sketching the case is hung below the easel. Larger sizes of the same form are made for studio use.

IT is amusing and instructive to see how soon public enthusiasm for a restoration cools when the work has passed from the phase of a project to that of an accomplished fact. Too often subscriptions promised in the heat of expectation lapse, unless promptly collected. This appears to have been the case in the restoration of Queen Eleanor's Cross at Waltham, to judge from the following appeal by Mr. E. T. Doxat, the treasurer of the Restoration Fund, which has come into our hands: "Eleanor Cross Restoration.—Notice of an action on Sept. 30 having been served on me by the contractor to recover the balance of £85, with interest due to him, I call on all those who have not paid their promised subscriptions to send the amount at once to me, in order to save the annoyance and cost of a lawsuit."

THE syllabus has just been published of the lectures on Quantity Surveying, to be given at the Birkbeck Institution next session by Mr. Henry Bushell, P.A.S.I. The course consists of twelve class lectures, to be given on Tuesday evenings from 6.30 to 7.30, commencing on Tuesday week, the 8th prox. The subject is treated in the order of trades. Questions and sketches are furnished to the students weekly to practise them in taking off, squaring, abstracting, and billing quantities in London firms; the answers are examined and returned, and practical examples are given of the several processes. The possession of a fair elementary knowledge of building construction is expected of students, and, judging from the syllabus, the course appears to be thor ugh and practical.

HE Classes for the Study of Architecture, Construction, and Modern Practice at University College, London, will commence for the session in the second week in October. Professor Roger Smith announces the usual public opening lecture for Thursday evening next, October 3, at 7.30 p.m. The subject selected is "Sir Christopher Wren and his Architecture." In the course of the lecture some reference will be made to Wren as an architectural draughtsman, and Professor Smith will give an account of the collection of Wren's drawings, preserved at All Souls' College, Oxford, which he has recently visited for the purpose of preparing this lecture.

IN connection with the movement for the registration of plumbers initiated and organised by the Worshipful Company of Plumbers, London, a special meeting of employers and employés of plumbers was held at the Lodge-room, Exeter Hotel, Oxford-street, Swansea, last week, to take into consideration means of adopting Swansea as the district centre for the registration of plumbers. Mr. T. E. Rosser was voted to the chair. Complaints were made that the plumbing work of Swansea was being done in a manner which was injurious to the public health. This arose from the fact that some of the plumbers had not been trained at all. Messrs. Lodwig, Collins, Lewis, Fisk, Schollar, and Walker, R.P.C., also spoke on the necessity for the registration of plumbers, and another meeting on the subject will be held in Swansea shortly.

CHIPS.

The new session of the Architectural Association will be inaugurated on Friday evening in next week, the 4th prox., by a conversazione to be given at the Westminster Town Hall by the President (Mr. Leonard A. S. Stokes) and the Committee.

One of the three-light windows in the north aisle of St. Michael's Church, Crieff, N.B., has been filled with stained glass in memory of the late Mr. John Dewar, architect, long an office-bearer in connection with the congregation. The inscription placed at the foot of the window reads as follows:—"To the glory of God, and memory of a revered parent, John Dewar, an elder of this church. Born 4th August, 1804; died 7th February, 1889." The window was designed and executed by Messrs. Heaton, Butler, and Bayne, London.

At the last meeting of the Ramsgate town council revelations were made as to a "missing" sewer in Arklow-road. It appeared that when the road was sewered the whole length of the new sewer was not completed, the contractor utilising about 90ft. of an old 9in. private drain which had been put in several years before. There were other deficiencies in the work, for all of which a certificate had, it was stated, been given by the borough surveyor. The Mayor said the confidence of the council in the surveyor had been greatly shaken, and the affair had brought the Council into discredit. The matter was referred to the Works Committee.

The foundation-stone of a new town-hall at Aberfeldie was laid on Saturday by Sir Donald Currie, M.P. The building will provide a public hall, recreation and reading-rooms, and library, and is being erected from designs by Mr. J. M. Maclaren.

On Thursday the Bristol and Gloucestershire Archæological Society held their autumnal meeting in Chepstow and neighbourhood. At Chepstow Castle the visitors were met by the custodian, Mr. Godfrey Seys, who conducted them over the ruins. At 2 o'clock the party proceeded in carriages to Caerwent, the ancient Venta Silurum of the Romans, and after spending an hour there they visited the ancient palace of former bishops of Llandaff at Mathern, as well as the parish church, said to have been founded in the 6th century.

The East Sussex County Council, at their meeting at Lewes on Tuesday, decided to take over the management of the 400 miles of main roads within their jurisdiction, and thus to abolish the system of parochial control, which has existed from time immemorial. The alteration is expected to result in a substantial financial saving, and also in an improved condition of the country roads.

A group of sea-water baths are about to be added to the West of England Sanatorium, at Weston-super-Mare. Messrs. Hans Price and Wooler, of Weston, are the architects.

During the absence of the Queen the eastern portion of the corridor at Windsor Castle, where some of the Royal functions are held, is being redecorated under the supervision of Mr. Collmann, Her Majesty's Inspector of Palaces. The renovations, which are of an extensive character, have been intrusted to Messrs. Johnstone, Norman, and Co., of New Bond-street. The work will probably be completed before the return of the Court.

The school board for Dudley have adopted plans by Messrs. Pincher and Long, of West Bromwich, for a group of new schools to be built at Netherton.

The tender of Mr. G. Moore, of Trowbridge, has been accepted at £2,690 7s., for the erection of new Middle Class Schools in that town.

MEETINGS FOR THE ENSUING WEEK.

SATURDAY, TO-MORROW.—Municipal Surveyors' Association. Meeting at Wimbledon. Paper on "Wimbledon and its Public Works," by W. Santo Crimp, Local Board surveyor. Visit to pumping stations, tanks, and sewage farm. Leave Waterloo station 11.27 a.m. train for Wimbledon.

TUESDAY.—Glasgow Architectural Association, "The Perpendicular Style of English Gothic," by Wilson Beaton. 8 p.m.

WEDNESDAY.—Historical and Archæological Association of Ireland. Quarterly Meeting at Royal Dublin Society's Theatre, Kildare-street, Dublin. 4 p.m.

THURSDAY.—University College, London, "Sir Christopher Wren and His Architecture," by Prof. T. Roger Smith. Free Public Lecture. 7.30 p.m.

FRIDAY.—Architectural Association. Conversazione at Westminster Town Hall. 8 p.m.

Architectural Association, 9, Conduit-street, W.—The opening Conversazione will be held on Friday, October 4th, at Westminster Town Hall. Members desiring additional tickets can obtain same at 2s. 6d. each, from Mr. F. R. Farrow, 2, New Court, Carey-street, W.C.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

BRISTOL.—For building two shops in Park-road, for Sir G. W. Edwards. Mr. H. C. M. Hirst, architect:—

Forse, H. A.	£600 0 0
Turner, S.	593 0 0
Bastow, J.	550 0 0
Perkins, J.	527 0 0
Hayes, C. A.	497 0 0
Beaven, A. J. (accepted)	495 0 0

All of Bristol.

BRONDESBURY.—For bank at Brondesbury, for London and South-Western Bank, Ltd. Mr. G. Truefitt, architect:—

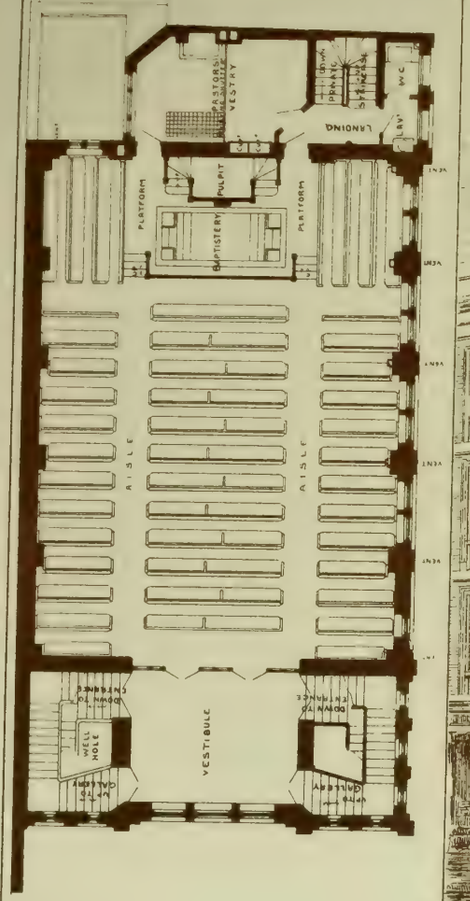
Cross and Son	£1,330 0 0
Lown and Son	1,225 0 0
Hunt	1,170 0 0
Oldry	1,145 0 0
Prior	1,125 0 0
Tenant and Co. (accepted)	1,120 0 0

CANONBURY.—For sundry ventilating works at St Stephen's church, for the vicar and church wardens. Mr A. Ardon, 6, Poultry, E.C., architect:—

Nicholls, J. W. (accepted)	£55 10 0



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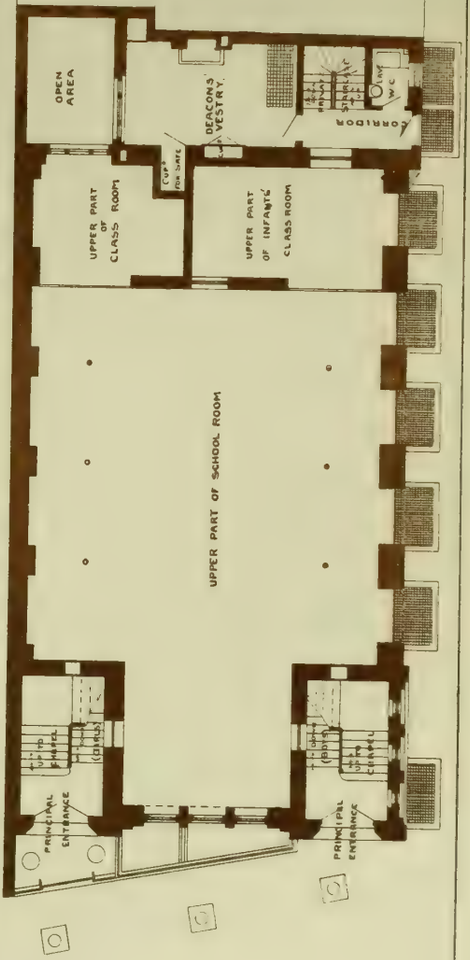


Plan at Chapel Level



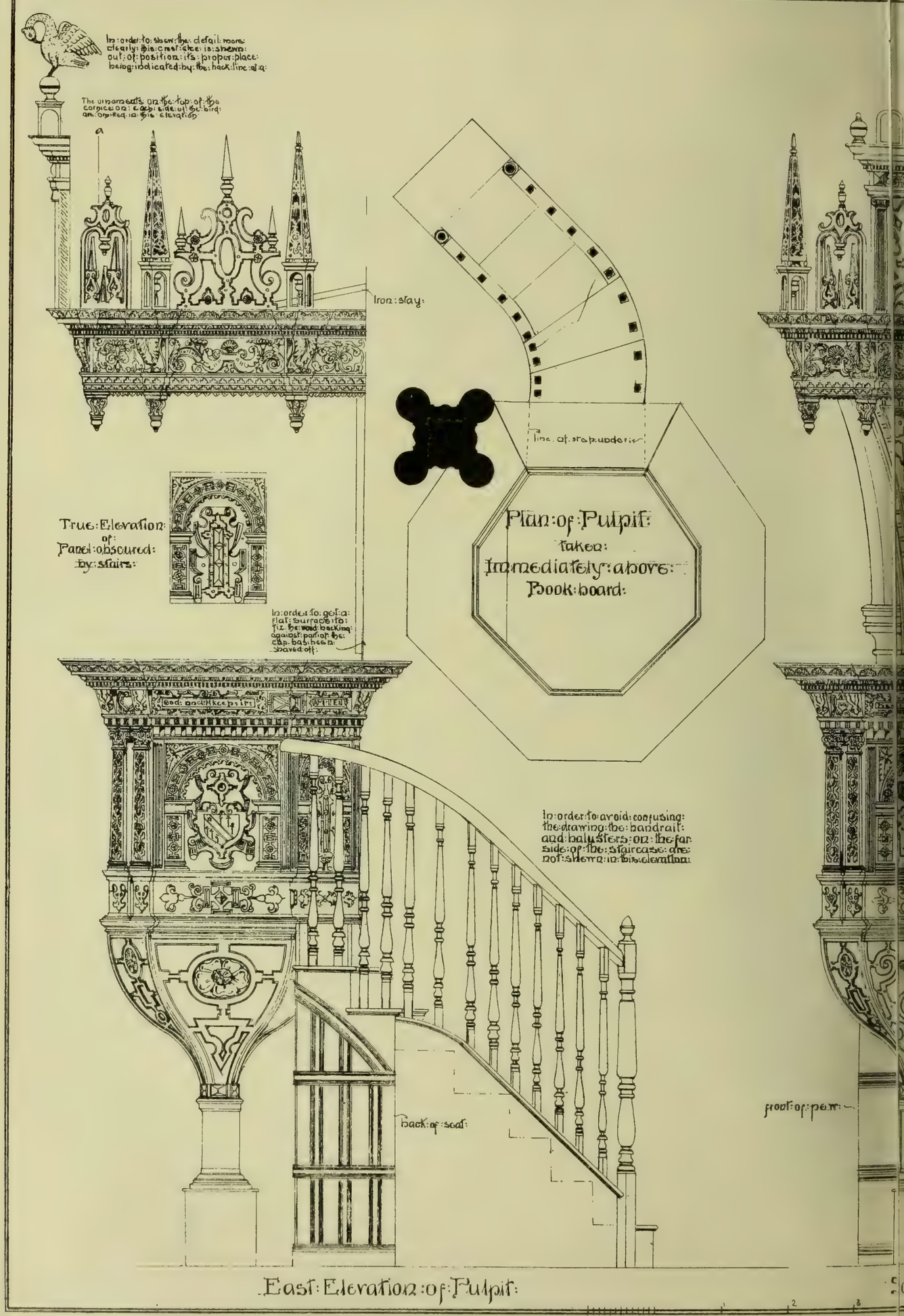
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W. GILLBEE SCOTT. A.R.I.B.A. ARCHITECT



Plan at Street Level

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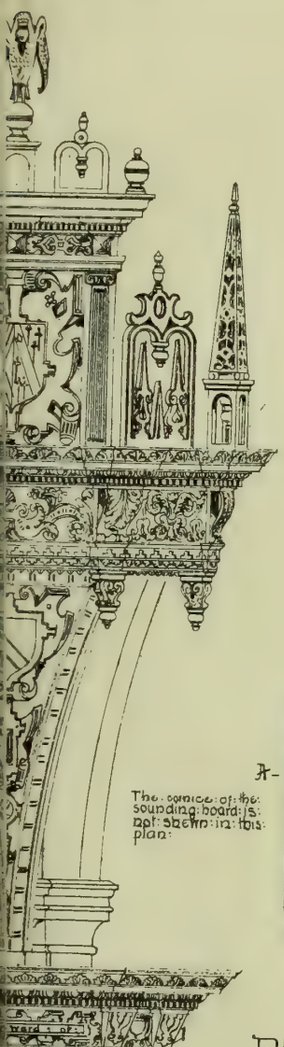


East Elevation of Pulpit

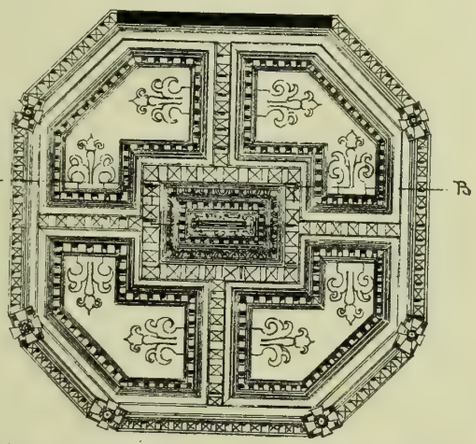
Pulpit: in: Croscombe: Church:

near:

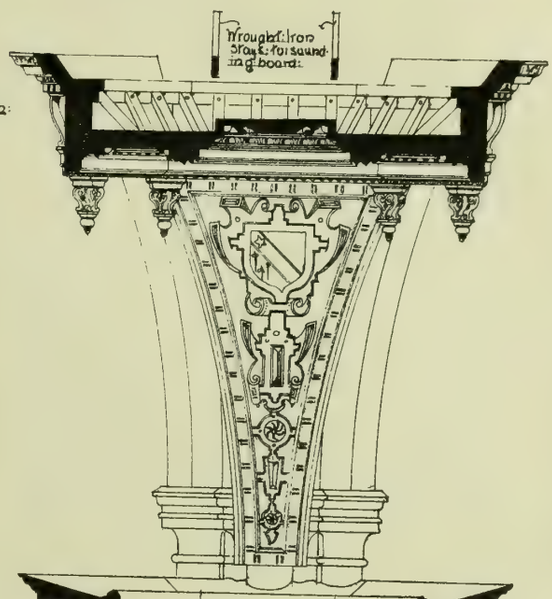
Wells: Somersetshire:



The: cornice: of: the: sounding: board: is: not: shewn: in: this: plan:



Plan: of: Soffit: of: Sounding: board:



The: Section: through: the: Sounding: board: is: taken: on: line: A-B:

The: Inscription: round: pulpit: is: "Blessed: are: they: that: hear: the: word: of: God: and: keep: it: "Amen"

The: hand rail: etc: on: the: four: sides: is: omitted: in: this: drawing:

Section: thro: middle: of: Pulpit: looking: North:

The: true: floor: of: pulpit: is: as: shewn: above: this: there: is a: moveable: floor: worked: by: a: screw: for: the: required: level:

All: carving: in: relief: etc: which: comes: in: Section: is: omitted: in: this: drawing:

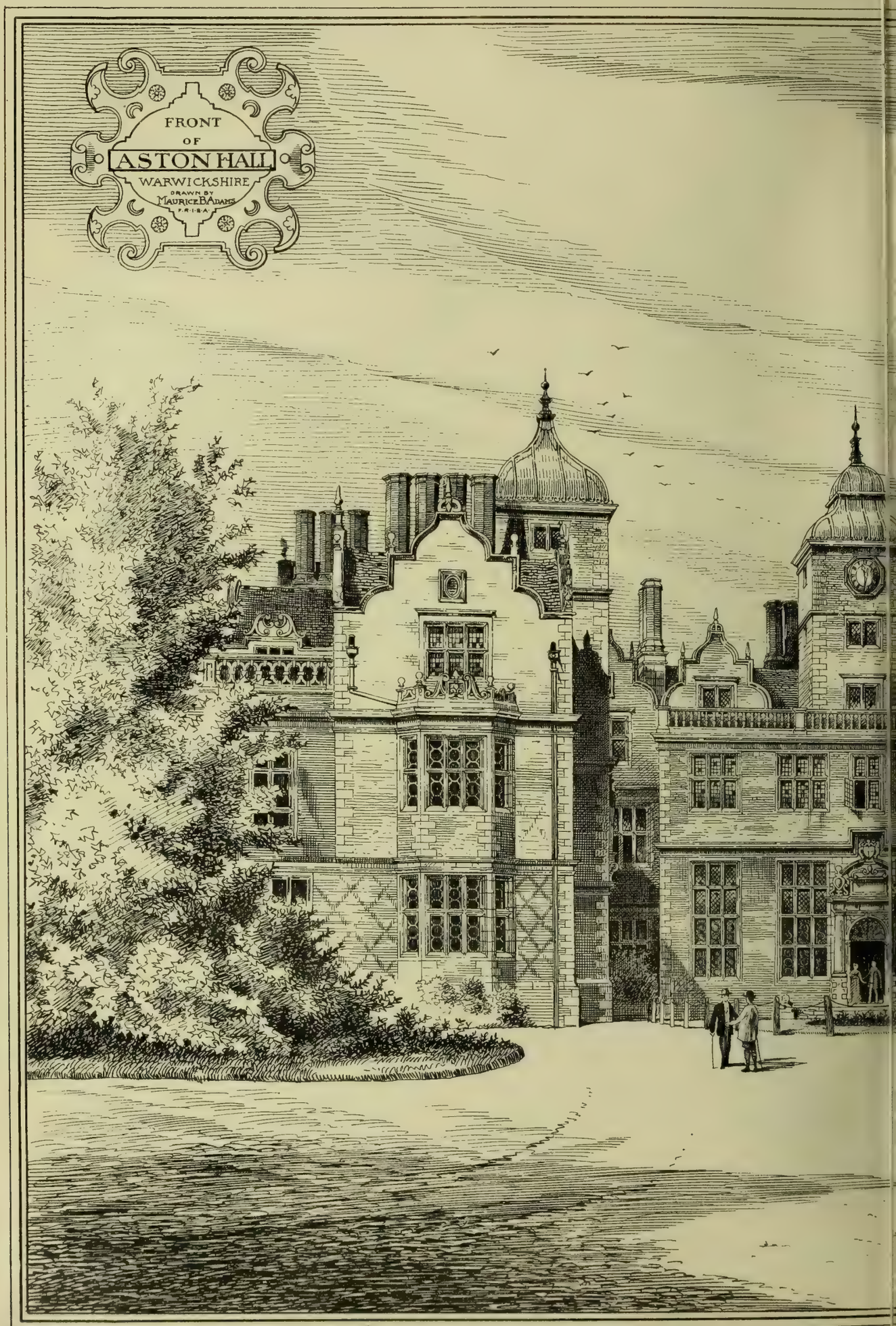
back: of: seat:

front: of: pew:

h: Elevation: of: Pulpit:

Measured: and: drawn: by: Arthur: Edward: Bartlett: MDCCCLXXIX:

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FRONT
OF
ASTON HALL
WARWICKSHIRE
DRAWN BY
MAURICE B ADAMS
F.R.I.B.A.

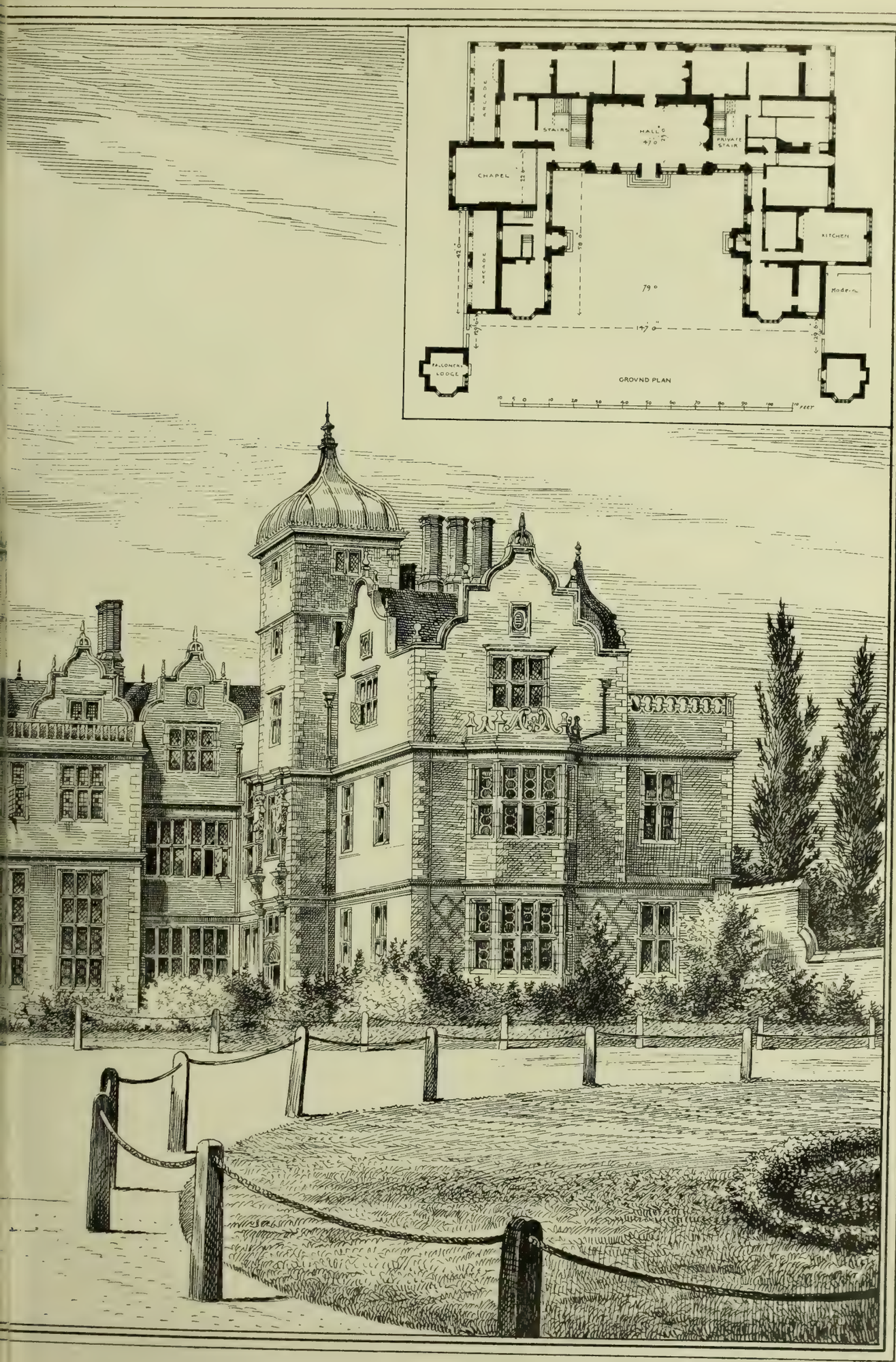
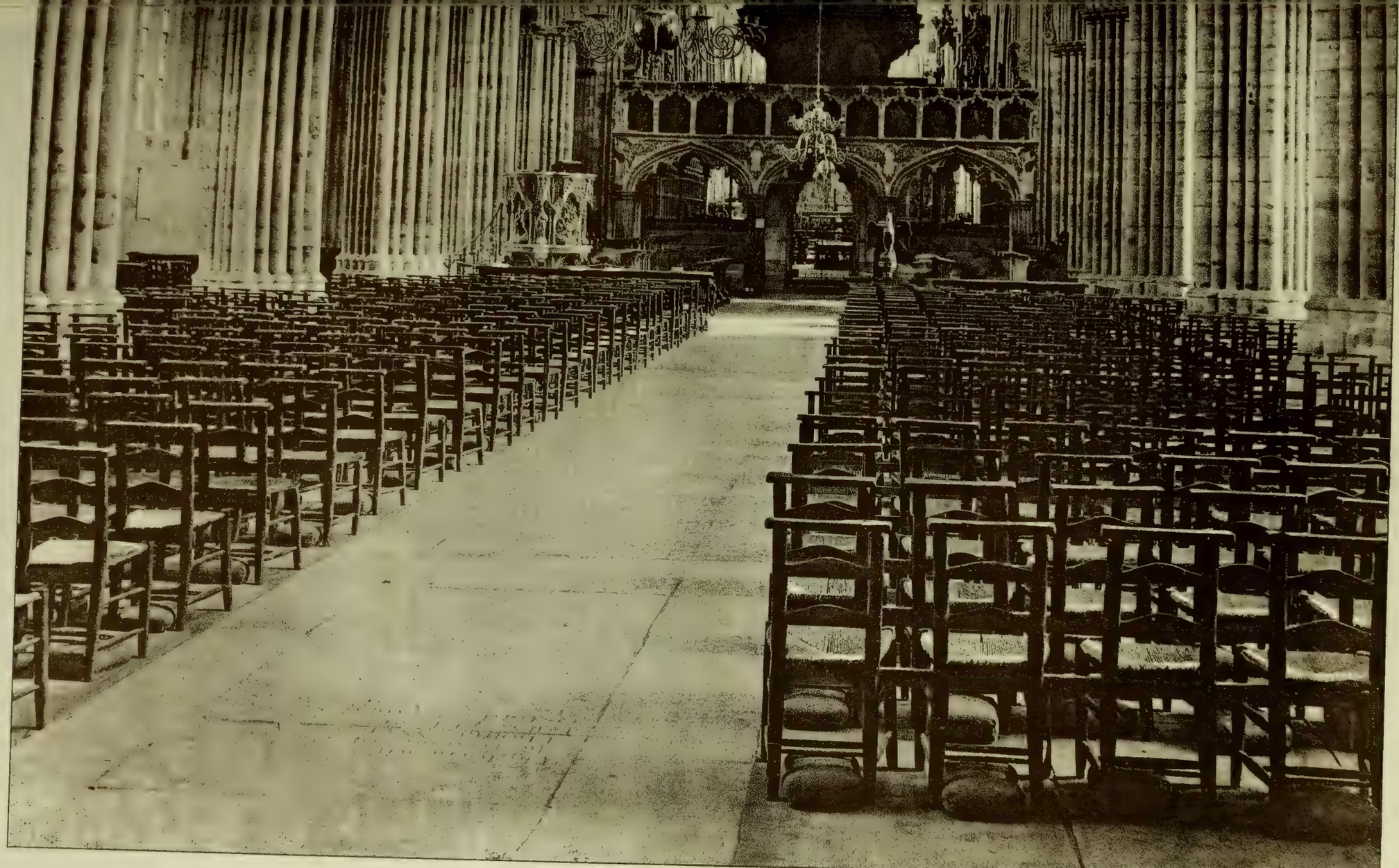


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EXETER CATHEDRAL - NAVE. LOOKING EAST - PHOTO BY HARRY TOLLEY.

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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
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FRIDAY, OCTOBER 4, 1889.

DESTRUCTION OR RESTORATION.

DURING the past few months our columns have contained many strong protests against the ill-judged and, in many cases, wanton alteration of our old churches, under the name of "restoration." Putting aside the stroug feelings which have been imported into the discussion, prejudices with regard to matters of doctrine and ritual, professional bias, and jealousy against amateur interference, we have no hesitation in saying there are many things that require explanation, and a great deal to try the temper of even the most moderate archæologist or adherent of logical consistency. "Grimthorpeism," or whatever term may be given to the craze for restoring old churches from the amateur builder's standpoint, existed, we suspect, in the old days of our Mediæval ancestors as well as it does now, if we can judge by the often crude and sometimes inharmonious additions and insertions made to cathedral churches, both in our own country and on the Continent. The spirit of unfeeling restoration has always been shown, and there are few of our old cathedrals that do not bear witness to the hands of the ruthless innovator, who thought he was a public benefactor, by doing something that shocked the more critical taste.

It is not our intention to enter into the lengthened controversy respecting the "Restoration of St. Alban's," about which so many angry words have been raised, as our readers will by this time have formed their own judgment on the work. No one can visit the church and look at the north and south transepts of that venerable abbey church without seeing that they have been "restored" in a manner that leaves very little of the original character. Questions such as these occur to the critical observer: Why have built square angle turrets? why insert a large circular window in a tall rectangular wall in a position where an old Perpendicular window did service? The circle touches abruptly the projecting angles of the turrets, and certainly does not fit in or harmonise with the vertical lines. Again the old south transept was picturesque, with its circular Norman turret and its Late Perpendicular window;—why have done away with the former, and have inserted a five-light lancet window to fill up the whole space between the turrets (the heads of which lights are merely a sham above the flat ceiling, though showing externally) in place of the latter? What affinity is there between a tall set of mullioned lancets and a circular window on the opposite transept wall? Why select two such diverse forms of window on opposite sides of the church? Other points will be noticed by the visitor who knew the old and takes the trouble to compare it with the new. The upper stages of the new turrets are crowned by heavy stone pyramidal roofs, the dog-tooth ornament in cornice looks coarse, and the round ball terminals of roofs crude; the large five-light windows of ashlar have a bald, metallic appearance which would have been less apparent if the plan of mullions or shafts had been relieved by more square members, and the shaft bands had been of less projection. The north transept is spoilt by the circular openings under the upper windows of turrets, the gable cross is large and heavy, and the large round window is too full of circles of different sizes and meagre cuspings. The turrets on this side suffer also from the want of gradation between the stringcourses which divide them vertically into stages. The composition of the round window of three orders of circles concentrically arranged admits also of criticism.

The hand of Time we see has toned down the west front. With all its faults, among them the heavy gable cross, the pierced parapets over aisles, and the plinth mouldings, this part of the new work is the least objectionable. Inside we certainly must quarrel with the flat commonplace deal ceiling divided into squares, and the struts which spring from the walls; the reconstruction of the whole of the presbytery walls, and the insertion of new windows are certainly uncalled for, though the work is now in a very advanced stage, and too late to be altered. In the beautiful sanctuary, the 15th-century Wallingford high altar screen denuded of its crucifix, the retro-choir with its fine watch gallery and screen of stone of the Duke of Gloucester, and the charming remains of the old Lady-chapel—we can still admire the original and untampered work of the old masons and carvers, and we hope that no alterations will be sanctioned here.

We speak now rather of the alterations and substitutions made under the name of "restoration," which ought properly to be confined to its strict meaning, restitution. Nor must we call rebuilding "restoration," though a great deal of the work done in latter years has been more of a rebuilding—careful it may be, and stone for stone, of the old edifice. In this process the old fabric almost entirely disappears, for it is pulled down, and the mouldings and details carefully reproduced in new stone, and rebuilt into the new structure. We have always doubted the logic or common sense of such a procedure. If an old building has crumbled so much, and has become so impaired by age that it cannot be restored, but must be rebuilt, why should it be made a copy of the old building? We can understand the rebuilding of a west front in its entirety, if it requires it, or a turret or window, the mullions and tracery of which have crumbled and become unsafe. In these instances it would be absurd to introduce a new or different design to the old, which would look patchwork if tacked on to the old building. For example, we approve of the restoration of the west fronts of Salisbury, of Winchester, and of St. Alban's being done in this way, or as nearly as possible following the proportions and lines of the old design. Let us call things by their proper names. If restoration be attempted, it ought to be strictly conservative, and as little as possible done to preserve the fabric for use; but this is not the spirit in which churches are now "restored." One correspondent, "Archæologist," points out the prevalence of the same spirit in the North Riding of Yorkshire, where a small church has been so transformed that its original features are all but lost—new roofs, floors, pulpit screen, aisle, &c., having been introduced; little of the old edifice remains. It would have been more correct to say the church had been rebuilt. Hundreds of old churches have been similarly dealt with, and have suffered the irredeemable fault of having lost their individuality.

There are two classes of historic buildings that are taken in hand by so-called "restorers." The first are buildings that are dangerous or so dilapidated that they must either be propped up and left to their fate, or rebuilt; second, those which are structurally stable, but require require restoring in detail—a category which includes by far the larger number of our old pre-Reformation churches. Few buildings which are used as churches can be left on crutches for the admiration of antiquaries; they are, therefore, wholly or partially rebuilt. There is no claim on the modern architect to replace exactly or copy the original edifice, and what is done need not represent itself as a reproduction of the old. To do otherwise would certainly not be the method which the old architects followed, but would indicate a slavish adherence to style, and would be to falsify the history of architecture in the future. But it is different when only partial or piecemeal restoration is necessary. A transept shows signs of a bad foundation. Should we rebuild it in another style? Certainly not, if the foundations can be underpinned, or if the rebuilding of one of the angle buttresses will secure the structure. The old design, as far as possible, should be followed to preserve the connection with and harmony with the older parts. We can rebuild in the 19th-century manner; but what is this mode but a poor imitation of some previous style? Again, it has been argued, in the case of St. Alban's and other restorations, that if the old work is poor and incongruous in design, like that of many old patched-up edifices, it is contrary to common sense to restore the part strictly according to the old design, which may be a later addition to the original church. If bad, no doubt it is undesirable; but we say generally that if the original intention is apparent, the new design may be made to agree with it; but if not, it is safer to restore the 15th or 16th-century features. But in how few instances can the original design be discovered? In the case of substituting a high roof for the late flat roof, or a lofty for a low spire, it is at least sometimes very doubtful if the walls will sustain the extra timbering and covering, and, in the former case, if the interior and acoustics are not all the better for the low roof, especially if a flat ceiling is introduced. Nice considerations will weigh with the experienced and cultured architect, which will be hastily set aside by the practical builder. We are quite aware that some are for pushing the "historical" argument to an absurd length in copying in new material a poor design that has not even the merit of antiquity in its favour. We know the old restorers never did so ridiculous a thing; but circumstances have altered. Our old edifices have become historic by virtue of age and association, whereas when they were altered or added to in the 14th, 15th, and 16th centuries they were comparatively recent buildings, and Gothic architecture was being developed.

In the interior of our churches there is perhaps excuse for alterations to suit the modified ritual, yet it would be glaringly wrong to pull down and rebuild the chancel of an old church because for the time it was necessary to enlarge the fabric, or because a clergyman of popular congregational tendencies desired to make it a preaching house. We cannot wonder at the havoc and destruction suffered in many of our old parish churches when we remember the revolutions that have taken place during the past two hundred years. The Puritanical rule permitted many structural alterations to be made, which was followed by the apathy and neglect of the 18th century. During this period of neglect—of whitewash, galleries, and "three-deckers"—more mischief was probably done to these buildings than they ever suffered during the era immediately succeeding the Reformation. The old roofs of timber were ceiled with plaster, the ancient roods and screens were demolished, galleries were erected which stopped up traceried windows. The rage for preaching ruined or entirely blocked up the chancels of many edifices. We can point to the same spirit among modern restorers, who have not hesitated in many churches to remove beautiful carved screens, and to make alterations. Those who restore churches ought to consider they owe a debt of gratitude to their ancestors and a duty to their successors. Restoration is making good the old, and has no necessary relation to rebuilding, while it should be remembered that substitution and alteration are incompatible with the desire to retain and preserve old fabrics.

LEVELLING.—XX.

INSTRUMENTS AND THEIR USE.

IN bringing this series of articles to a close, we have considered it necessary to make a few observations on two or three of the most important surveying instruments in use, referring the reader for further information to treatises on the subject. A great deal of misunderstanding exists as to the construction and use of certain instruments used in surveying. We shall now make a few remarks on the prismatic compass—an instrument that should be in every surveyor's hands. In the articles on Surveying we have described how useful it is in taking bearings, especially in traversing, and that in some respects it supersedes the theodolite, being light, portable, and almost equally accurate in taking the magnetic north. The magnetic card, which is balanced on an agate pivot, is divided into 360 degrees and half-degrees, sometimes to one-third or 20′ of a degree, and is placed in a box about $2\frac{3}{4}$ to 3in. diameter, having a sight-vane and magnifying prism on opposite sides of the box which are hinged to it. When making an observation the box is held horizontally, the eye is directed through the slot towards the thread of vane, and the prism at the same time brings into view the reading on the card. The compass enables the angle formed by a given line and the magnetic meridian to be thus observed. For a minute technical description of the prismatic compass we refer the reader to any work on surveying instruments. We shall now content ourselves with explaining the main features of the instrument, and how it is used in taking bearings. The first thing that will be noticed is the order the card is graduated; the north on the card is marked 180°, and the south 360°, instead of the contrary. This arrangement of graduating the card from the south, reading west, is made in order to show the degrees of an angle to the east of north. Thus the north is 180°, the south 360°, the east 270°, and the west 90°, and this order on the card allows the 360°, or zero, to be brought under the prism when the vane is directed towards the object or bearing. The numbers are also inverted on the card so that they may appear in the right position when seen through the prism. For bringing the floating card to rest a button or spring is provided. Let us suppose we require to take a bearing. The compass is held over a station point, or any point at which the required line has to be taken; the instrument is turned horizontally by the hand until the thread in the vane bisects the point to be observed. The card is steadied by the spring, and the number of degrees is read through the prism, and denotes the angle with the magnetic meridian. For example, let the plan of card (Fig. 45) represent the position, the nearly upright dotted line across it the direction of the object to be sighted, the magnetic north lying to the left of observation. Here, counting from zero, or the 360°, the degrees read will be 35°, as the card reads from 360° westwards; suppose the object sighted is to the left hand of the magnetic north (shown by the other dotted line), the degrees will read 338°, reading in the same direction round the compass from 360°. Now when the angle read exceeds 180°, the angle of deviation at the point of vision is equal to the difference between 360° and the number of degrees read on the card—e.g., 360° − 338° = 22°, which is the angle of deviation required. Hence it may be stated, when the angle is less than 180°, the number of degrees read will equal the angle, when the angle exceeds 180° the correct angle must be obtained by subtracting the observed number of degrees from 360°.

In Fig. 46 we show a plan of five streets which meet together; in a survey it is desirable to obtain the deviation of one or all from the magnetic meridian. The lines of sight through the roads having been poled out, as shown by the dotted lines, the prismatic compass is held at the centre station; the magnetic north lies to the left of the line of observation, which coincides with the direction of the road. The first reading is 18°. The next road to the right hand shows a deviation of 35°; the third road on the same side reads 135° to the middle of road. On the west side the angle of the last road will read more than 180°, and the observed number of degrees will be subtracted from 360°.

Suppose we have a crooked country road to survey, bounded by fences. We stake out lines as shown in Fig. 47, erecting poles at

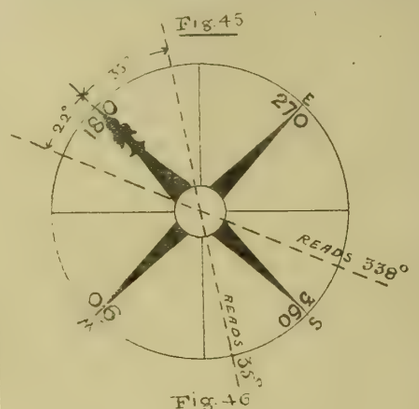


Fig 46

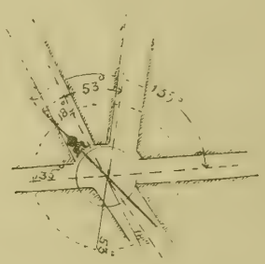
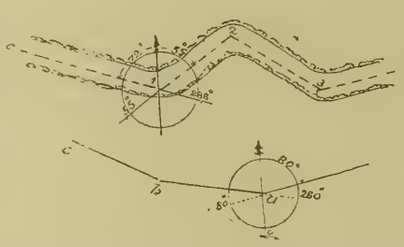


Fig 47



stations 1, 2, 3, &c. We hold the compass directly over station 1. Hold the box as level as possible, and sight the pole 2 through the prism, bringing the vertical sight-thread to coincide with it, and when the card is quite steady, read the angle through the prism. The observation as to the direction of 1 and 2 with magnetic meridian is found to be 55°, that number of degrees being read on the opening in the top plate of the box; we can then turn the box and sight round towards the line 1, 0. The reading is found to be 288°, and if we subtract this from the whole 360° we obtain 72°, the angle from magnetic north to the line of direction 1, 0. At stations 2 and 3 the same process is repeated. The plan can easily be plotted by drawing the centre lines of road by the aid of a large card protractor, and by transferring the distances measured between the stations. Or draw meridian lines through the stations, and place the straightedge of protractor along them, pricking off the angles. We have already explained the process in our articles on Surveying. There is one disadvantage under which the prismatic compass labours: the magnetic needle is affected by the proximity of iron, the presence of which must be avoided. In our next we will devote attention to other instruments.

LIABILITY OF TRADESMEN IN BUILDING.

THERE is a useful rule in specifications to the effect that each trade is liable to make good his own work for any damage done by another succeeding him in order of time. We can well imagine, where separate contracting is in force, what the condition of a building would be if each tradesman or his men were allowed to cut into or disturb the work of the preceding trade without someone being called upon to make restitution. We may picture such a result as the following: The plastering and brickwork cut about for water-pipes, bellhanging and gas-fitting apparatus, the walls hacked and cut into for grates and ranges, the painting damaged by sundry requirements of the bellhanger or gas-fitter, and each tradesman declining to make good the work that is not his own. In order to prevent such an untoward conflict between those engaged in the various trades, it is usual to insert a clause under each trade in both specification and quantities to the effect that "each trade is to provide for the expense of the attendance on other tradesmen for making good their work." Thus, for example, it is very important to insert in the conditions of the plasterer and painter that they are to make good after the plumber, gas-fitter, bellhanger, electric-lighting engineer, &c., so that the work may be left perfect and finished. In putting up chimneypieces the damage done to the jambs and walls and papering is often considerable, and unless the plasterer and paperhanger make good, the rooms are left in a very dirty and imperfect condition.

In the conduct of ordinary building sufficient attention is rarely bestowed on this very important requirement. Architects omit to insert the clause in their specification or make it clear, the quantity surveyor neglects to make it an item, the consequence being that each trade is allowed to have its own "sweet will." There is a want of attention to the details which are left unfinished, the tradesmen repudiate their liability if they have been engaged separately, and what is everybody's business becomes nobody's. Of course we do not refer here to the work of the respectable contractor, who, for his own reputation, takes care to see there is no cause for complaint, that each trade finishes and makes good after all pipes, grates, chimneypieces, and bell apparatus have been fixed. The allowance to be made for each trade to attend upon all other trades, and to do jobbing work in connection with other operations is considerable in a large house; and the rougher and less skilful the tradesmen employed the greater is the sum that is necessary to be put down to make good after them. Therefore, if the terms of the agreement are not clear, there is a strong desire to shirk the duty. The unfinished state of many modern houses is due to this circumstance. A great deal of friction would be avoided if each tradesman took the trouble to look a little ahead of him, to study the specification, and by such means prepare for or make arrangements with succeeding workmen about fittings. Thus the bricklayer ought to know what carpentry has to be prepared for or joinery fixed; the carpenter and joiner ought to know the requirements of the plasterer, and the latter the wants of the founder and smith. The present disunion between building trades has to a large extent rendered co-operation impossible; and in the preparation or small contracts, or the pricing of quantities, builders are less solicitous to obtain a

number of hands that will work harmoniously together, and who are masters of the trades, than to obtain a foreman that will exact the maximum results in the least expensive manner.

On behalf of the architect, the clerk of works exercises control over operations of the kind, and we seldom see a building in which his services have been employed that exhibits any inattention to details of this sort. The value of constant supervision is here evidenced; the clerk, having the intention of the architect before him, is able to direct each tradesman, and thereby to save a great deal of their time, and prevent a good deal of cutting and hacking about to walls and plaster, making alterations. Consequently, there is less to make good to the trades, and the attendance required by each is reduced to the minimum. But every building has not the advantage of a skilled clerk of works; the infrequent visits of the architect are taken advantage of by contractors and men, and hence the importance of specific clauses under each trade in the specification. The details of cutting chases in walls for pipes and tubes for electric lighting or bells ought in all cases to be defined. For example, how often hot-water pipes are carried up in chases of outer walls, the plasterer coming afterwards and covering them up. Can we wonder at disastrous consequences to internal decoration and costly wall-papers should any leakage occur? Suppose an alteration is necessary to the pipe, the whole of the wall would be destroyed. Now this absurd practice is largely followed in houses where a separate casing ought to be introduced for all the pipes. This casing ought to be defined on the plans so that the bricklayer or plasterer may make preparations for it, and not be compelled to re-do a great deal of his work by the hesitation of the plumber or his men in fixing the position of the casing. The same remark applies to all fittings to walls, which are generally left till after plastering is finished, and the decorator is about to commence his operations.

SIR CHRISTOPHER WREN AND HIS ARCHITECTURE.*

NO preface appears to be needed to a paper on this subject. If the merits and fame of the works of the most distinguished modern architect who has flourished in this country are not sufficient to bespeak a favourable hearing for some account of Wren and his architecture, nothing that I could say would be of much use. The great good fortune of Wren was that the most splendid opportunity which any English architect has enjoyed was by a sudden stroke thrown open before him. His great merit was that he proved to so full an extent equal to that opportunity; and this it is which constitutes his chief claim to our admiration. It is almost unnecessary to add that the opportunity I refer to was created by the Great Fire of London, which laid almost the whole of the metropolis North of the Thames, as it stood in the year 1666, in ashes. By the Fire Mediæval and Elizabethan London was practically swept away from the face of the earth. Probably, but for that event, parts of London would still present as picturesque an appearance as Chester, Coventry, and Shrewsbury. Certainly there would be many interesting Mediæval churches. As it is, of the domestic buildings of Old London, Crosby Hall, and one or two houses in Bishopsgate-street, and the half-timbered gables in Holborn are almost the only representatives; and of the churches, St. Bartholomew in Smithfield, the chapel in Ely-place, the church in Austin Friars, and St. Saviour's, Southwark, are the chief, if not the only ones left. A vast rebuilding was necessary. The churches and cathedral required to be rebuilt, as well as the dwelling-houses, public buildings, and places of business. Gothic architecture was now past and gone, and the mixed styles which we know as Elizabethan and Jacobean that succeeded, had by this time fallen into disuse, or nearly so, and had to be abandoned, so far as half-timbered construction went, owing to the conviction which had impressed itself strongly on men's minds that brick-built houses alone would be safe from fire for the future. Here, then, at a turning point in the architectural history of this country was a great opportunity. Revived Classic had come from Italy and from France, and was the only style of the day; it was as yet a fresh thing in this country, nor had it become exhausted, though past its prime, in other parts of Europe, and not a few of the problems which would present themselves, had not been solved before. Would any artist, or any group of artists be found equal to the occasion? We know now what the response was. Wren was then in the flower of manly energy, and enjoying a splendid reputation as a rising man; it was by him that St. Paul's was rebuilt, together with the parish churches of London, and not a few similar buildings. Under his supervision the destroyed streets were realigned, and it was not his fault that the rebuilding was not made (so far as the laying out of the plan was concerned), the occasion for imparting a nobility and regularity to our streets and river banks, which would have made London a very striking and yet regular city, for he prepared a most remarkable plan for a redistribution of the land, so as to embank the Thames and to provide main thoroughfares 90ft. wide, anticipating by 200 years the improvements of our own day. Let us dwell for a moment on the state of the public mind at the middle of the 17th century, so far as we can get a glimpse of it through the writings which have come down to us, or imagine it from the circumstances of the time. If we endeavour to carry ourselves back to the year 1666 we shall have to recognise in the situation some features which are not quite unlike those of our own day. The immediate past had been a time of change, ferment, and displacement of old ideas and ways by new ones, and perhaps it was well that the epoch of the Fire of London, with its great demands on public spirit, succeeded to such a time rather than to some more tranquil period. Think for a little of what had been going on. The great struggle between Church and State, which had formed one of the features of English political life and strife for centuries, had been concluded by Henry VIII., with a high hand in favour of himself as representing the State. He had overcome the power of the Church, spoiled its goods, and finally broken with Rome altogether. In Elizabeth's reign the defeat of the Spanish Armada and the opening up of America, the New World, had been stirring events in our national life; and the gradual consolidation of the Empire had been all the while steadily going on. The Civil War, with all its bitterness, the death of Charles I., the Protectorate, and the Restoration had each in turn passed over the country; and men at the commencement of Charles II.'s reign must have felt that as wide a gap separated them from their forefathers of Henry VIII.'s day as we, after the invention of steam travelling and printing, telegraphs and the electric light, feel to separate us from our ancestors of, say, George III. Turning to letters and learning, Shakespeare, Spenser, the Elizabethan poets and dramatists, and Milton had just created the literature of which we are so proud, and had cast into the shade the writers of the Middle Ages; meanwhile in science the human mind was awakening from a sleep of nigh two thousand years, and Bacon had shown the way to proceed with investigations such as, since Aristotle and the other Greek philosophers, no one had touched. Experiment was being substituted for guesswork, and Wren was one of a body, among whom the illustrious Newton was *facile princeps*, who were laying the foundations of that astonishing advance in science which we wonder at to-day. In art a complete revolution had been effected, and had reached our shores. The artists of the Italian Renaissance had revived Classical architecture as well as sculpture, and had revolutionised painting, and their influence had spread over France, Spain, Germany, and, latest of all, Great Britain. At the moment which we have reached architecture was almost on the decline in Italy. Bernini was the most famous Italian architect of the time. He had just completed the great piazza in front of St. Peter's, and Bernini's work all belongs to the period after the best in Italy. The same can hardly be said of France, where probably the best Renaissance work then being executed in Europe was in hand, or of England, where the Renaissance in architecture may be said to have just culminated in the work of our best Renaissance architect, Inigo Jones, who had died in the year 1652. Inigo Jones for purity of taste and refinement in architectural design stands extremely high—higher, indeed, than Wren himself—though whether, if the same calls had been made upon him that were made upon Wren, he would have been able to respond to them equally well, is another question. Clearly, therefore, the English people and their architecture had, to a remarkable extent, begun what is emphatically their modern career. Whatever was built was to be built in the new taste—that is to say, after the Italian fashion, now usually styled Renaissance. Whatever was to be done must be done in a reasoning spirit. Whoever was to be the architect for the time must then be a man not strange to the new science, and thoroughly in harmony with the new architecture. I have taken some pains to point out all this, because you will see directly that Wren's turn of mind and training were both such as to fit him for the work required at that moment to be done. Wren was emphatically a Renaissance architect; he was also deeply versed in the study and practice of the science of his day. He had to reconstruct a vast mass of Mediæval buildings, and never hesitated for a moment to substitute architecture in accord with the taste of the day in his rebuildings, and he could not have done otherwise. Yet he was not so entirely blind to or intolerant of the style in which Gothic architects wrought as I think some of us were a generation back in our aspect towards the style he practised, and his parish churches show singularly the influence of Gothic traditions in moulding Renaissance into a new and hitherto untried shape, while here and there he attempted, not altogether without success, a Gothic building. I propose, in the first instance, in a few words, to give the bare outline of Wren's biography. I will then turn to his chief work—St. Paul's Cathedral—and to some of his other architectural undertakings (for it will be impossible even to enumerate the whole of them), and I will conclude by some account of Wren as a draughtsman—a subject which has been less handled than the rest. The chief authority for the events of Wren's life is the "Parentalia," an interesting and scarce work, published in 1750 by Wren's grandson, Stephen Wren, though on the title-page it is stated that it—or part of it—had been compiled by Wren's son, Christopher. This is a kind of family history, in which, however, the great architect properly occupies the most conspicuous place. A life by Elmes, and a volume entitled "Wren and his Times," by the same author, add a certain amount of information, and recently a pleasantly-written biography, which does not, however, much extend our knowledge, has been published by Miss Phillimore. Wren's churches have formed the subject of a good publication by Clayton, and recently a volume of his towers and spires has appeared. St. Paul's has, of course, been engraved times without number, but such a monograph as should adequately illustrate that noble building is still wanting. An interesting and useful book is, however, Mr. Longman's "Three Cathedrals of St. Paul," and a wonderful tribute to Wren's genius was the composition by Cockerell, in which all his chief works were thrown together. There are various essays and papers on Wren to be found in the various journals, including a very able paper published a good many years ago by Professor Kerr; and, more recently, some critical essays, well worth reading, by Mr. Basil Champneys, published (I think in 1882) in the *Magazine of Art*. To those who desire to pursue the subject further the books I have named will be useful, though a careful study of the actual works left by the great architect will be in every way the best source of information. Christopher Wren was the son of a clergyman of good family and position. He was born October 20, 1632, at East Knoyle, in Wiltshire. His father was Christopher Wren, D.D., chaplain to King Charles I., Dean of Windsor, and holder of other distinctions. Elmes says of him that among other accomplishments he was skilled in architecture, and that he was employed by King Charles I. to design a palace for the Queen; and has printed the brief approximate estimates for its erection which he prepared in his "Life of Sir Christopher." A brother of Dr. Wren was

* Lecture delivered by Professor T. Roger Smith, at University College, London, last Thursday evening, on the occasion of the opening of the courses of Architecture there for the session 1889-90.

Bishop of Ely, and after the revolution was impeached and thrown into the Tower, where he lay for 18 years. Our hero was an only son; he was a precocious boy, being described as "a youth of prodigious inventive wit." His early education was pursued at home under the dean, his father, and a private tutor. He then entered Westminster School, and at what seems to us the early age of fourteen, went, A.D. 1646, to Oxford. He took his M.A. degree and was elected a Fellow of All Souls in 1653, when he had just completed his 21st year. The length of a college course and the time of beginning it were at that time different from the customs of our day. In 1657 Wren left Oxford, where he had given himself chiefly to scientific work, for London, having been appointed Professor of Astronomy in Gresham College, and being then in his 25th year. This closes his long period of eleven years residence at the University. In the year 1660 he was appointed Savilian Professor of Astronomy at Oxford, and in the year 1661 he received the degree of D.C.L. not only from his university of Oxford, but also from that of Cambridge. At or about this year Wren's connection with architecture seems to have begun, for he was appointed Deputy Surveyor-General of Works under Sir John Denham, the poet, who was the surveyor. In 1662 he was appointed a member of a small commission which had to do with roads, streets, buildings, &c. In 1663 he began the Chapel of Pembroke College, Cambridge, and in the same year he undertook the Sheldonian Theatre at Oxford, the first building of considerable importance of which he is known to have been architect. In the same year he declined an offer of employment to fortify Tangier; but he (also in 1663) was appointed to survey and report upon the state of St. Paul's Cathedral, then seriously decayed and injured, partly by the lapse of time and neglect, but partly also through ill-usage during the period of the Commonwealth. Two years later, 1665, Wren visited Paris, where at that time a great deal of architectural work was going on, and where he spent some months. In the following year, 1666, occurred the Fire of London, and that event, as we already know, called Wren to the front at the very moment when he had attained sufficient success as an architect, and sufficient distinction as a public man for him to be naturally thought of as the builder of the future St. Paul's. Briefly to enumerate the salient points in his after-career, he was knighted in 1673; the first stone of St. Paul's was laid by him in 1675; in 1680 Wren became President of the Royal Society, in 1685 he was first elected Member of Parliament, in 1710 the top stone of St. Paul's was laid, and Wren's death occurred Feb. 25, 1723, in the 91st year of his life. It may interest some volunteers of the present day to add that in 1669 he became a member of the Hon. Artillery Company. He was also elected Grand Master of Freemasons. The thirty-four years from the date of the Fire to the end of the century were the busiest part of Wren's professional life, and the amount of important work carried out by him in that period of time was immense. A bald narrative like this does not leave much impression on the mind; but at least we learn from it that Wren had excellent opportunities for obtaining the best education that his day afforded, and that he so distinguished himself as to attain high honours at an early age. To receive the degree of D.C.L. from both the Universities before a man is thirty years of age was no small distinction, and one that neither wealth nor connection could purchase; nor was the position of President of the Royal Society less a coveted distinction then than now. The accounts of Wren at Oxford and afterwards are full of his abilities and successes, not as an architectural student, but as a student of science, and especially of mathematics. His early employment as Professor of Astronomy testifies to the esteem in which his attainments as a man of science were held, and from the age of 13 onwards he appears to have pursued mathematics and physical science with avidity, and to have become famous as an inventor and discoverer. The "Parentalia" contains a list of more than 50 new "theories, inventions, experiments, and mechanic improvements" exhibited by Wren at meetings of scientific men at Oxford. It also contains notes of experimental and other work done by him in astronomy. In the same publication there is a catalogue of over 40 philosophical tracts published or left in manuscript by Wren, and there is evidence of his having been both eminent and brilliant in the pursuit of science as it was cultivated in his day. Perhaps, however, the best evidence of his position in the then world of science is the fact that he was one of a small knot of scientific Oxford men who used to meet and discuss science, and who formed the nucleus of the Royal Society, the most famous of the many scientific societies in Great Britain. This was founded in the year 1660. Wren's draft of the first Charter is extant, and, as already stated, in 1680 Wren was elected president of this distinguished society. It would be easy, were it necessary, to expand the evidence as to Wren's having become eminent in science, and it is not difficult to see how he became so. Curiously enough, it is not equally clear how he became an architect. Some glimpses at his possible course of study are, however, afforded. First of all, there is the fact that his father, his early instructor, with whom he seems to have kept up an affectionate and respectful correspondence through life, was more or less conversant with architecture. This circumstance probably gave an early bent to his disposition. Among the scientific and other papers and inventions in the two lists above named was at least one that bore a little on the subject. The heading was "New Designs Tending to Strength, Convenience, and Beauty in Building." The probability is, however, that the appointment of deputy surveyor general, which he received in 1661, was the thing which induced him to turn his attention seriously, and as a matter of professional occupation, to an art which had previously attracted his notice only as one among other subjects worthy the study of a scientific man of education and culture. I should be very glad to be able to throw a little more light on this part of Wren's career, but I have not met with the materials for doing so. One thing, however, seems clear: Wren was not trained, as many of the Italian architects had been, in the practice of painting or sculpture, an advantage which Inigo Jones had enjoyed, and the weak point in his architecture is a tolerance of inferior ornament and ugly forms, which that cultivation of the hand, eye, and taste which is best obtainable—perhaps only attainable—by learning to draw or model the human figure would have prevented. We will now at once turn to Wren's masterpiece—the Cathedral of London. Old St. Paul's Cathedral had fallen some time before the Great Fire into decay and disrepair, and not many months before that catastrophe Wren drew up a report in which he contemplated the demolition of the failing tower at the crux, and suggested that the inner corners of the crossing might be cut off, and a space formed which could be crowned by a dome; and if a large dome was to be introduced, an octagon was practically the obvious substructure. In Mr. Longman's book is an engraving from one of the All Souls College drawings of a longitudinal section, showing what was proposed, and the plan (which Mr. Longman did not engrave) shows that this dome would have sprung from an octagonal base, the four sides towards the cardinal points being pierced by arches, the four diagonal sides being lightened by deep recesses, but not pierced. A lofty drum and an inner and outer dome form part of the design, and it is interesting to note these features, since they reappear in the subsequent elaboration of the designs which were one after another prepared. After the Fire, years elapsed before the rebuilding actually commenced. Wren prepared several sketch designs, as he quaintly put it, "merely for discourse' sake to find out what might satisfy the world." There are among his drawings at Oxford various studies and sketches for cathedral ground-plans, some of which may very possibly have been the ones thus alluded to. It seems that he was at this period in the habit of showing his designs to friends of the Royal Society, and, of course, the Court and clergy would have to be consulted. A design, which was one of these sketches, and which he is said to have preferred to any other that he made, was selected for execution, and was embodied in a large model, still preserved in the cathedral. This design was ultimately set aside, much against the architect's wish, as not being sufficiently like the customary cathedral plan. For several reasons it deserves a little notice. It exists, as has been said, in the form of a large model: it is engraved in Longman's book, and a very good idea of it may be formed from the fine drawings hanging on the staircase of the Royal Institute of British Architects. This design, the model-design as we may call it, more nearly resembles a Greek church than any Western type; but in it the usual idea of such a church as Sta. Sofia, or St. Vitale of Ravenna, is largely modified, even if the original suggestion comes from the East—which I doubt, and the result is a very original composition, mainly, I think, the outcome of original thought as to what a Protestant cathedral needed.

(*To be continued.*)

SOCIETY OF ENGINEERS.

ON the 1st October a visit was paid by the Society of Engineers (1) to the Central Station of the London Electric Supply Corporation, at Deptford, and (2) to the Foreign Cattle Market at Deptford.

At the Foreign Cattle Market the party were received and conducted over the market by the superintendent, Mr. George Philcox.

The market was constructed on the site of H.M. Deptford Dockyard, and occupies a space of about 25 acres, with river frontage of upwards of 1,000ft. The old shipbuilding slips and docks were filled up and lairage for cattle and sheep provided on their site. The warehouses and other buildings were converted into slaughterhouses and other premises, necessary for the purpose of carrying on the business of a large slaughtering establishment, as no bullock, calf, sheep, or pig would be allowed to leave the market alive. For the purpose of landing animals consigned to the market three substantial jetties were constructed, extending into the river 165ft. Vessels ranging from 400 to 4,000 gross tonnage land cattle at these jetties. Continental steamers can berth alongside at all states of the tide, and Atlantic steamers at about half flood tide. Animals are landed immediately the vessel arrives, both by day and night. During the last ten years considerable alterations and additions have been made to the market to meet the increased trade, additional land has been purchased, and the market now stands upon nearly 30 acres of ground. Covered lairage is provided for about 5,000 head of cattle and 23,000 sheep, and there are also 62 separate slaughterhouses. About ten and a half million animals have been landed and slaughtered at Deptford since the opening of the market. A refrigerating machine has lately been added to the market, having chill rooms attached for the purpose of cooling fresh meat in hot weather.

The premises of the London Electric Supply Corporation at Deptford, which are now in a forward state, promise to be one of the most remarkable industrial establishments of the Metropolis. This corporation aims at supplying all-comers with electric light, and from what can be seen at the present moment there is little doubt of their being able to go very great lengths towards the realisation of their views. The directors have laid down lines for the eventual supply of 2,000,000 of lights from their great central station at Deptford, from which they will be able to convey the electric current to all parts of the metropolis. As an earnest of their future intention, the corporation is now erecting machinery for the supply of 250,000 of those incandescent lamps which may now be seen about the town, and are erecting a building (which may be adequately described as colossal) capable of containing the necessary machinery for nearly four times that number of lamps. The premises in question consist of a fine riverside site of nearly four acres in extent, almost the whole of which, with the exception of a wharf retained for unloading the great masses of their machinery and the supply of fuel, will be covered with engine and boiler-houses of great size and most massive construction. The buildings now in course of construction consist of one boiler-house and two engine-houses, occupying a space of 210ft. by 195ft., and having a height from basement to the crown of the arched roofs of something approaching 100ft.

The boiler-house, a great building 195ft. long by 70ft. broad, with a height of nearly 100ft., is constructed to contain boilers of 65,000H.P., and of these a number are now being erected, which will give steam for engines of 13,000H.P. These boilers are arranged on two floors, the upper floor being supported on iron pillars of immense strength, 30ft. high, and above the upper boiler floor is another floor similarly supported which will contain the store of fuel, which will be supplied to the furnaces by means of vertical shoots passing through the centres of the floors of the upper boilers to the lower ones. It may be said once for all that every known

labour-saving device is made use of, and that no expense is being spared to employ all the best known means of combining efficiency with economy in the carrying out of this great enterprise. For the supply of fuel and the unloading of the heavy masses of machinery, a substantial wharf has been constructed, on which has already been erected a great iron steam derrick, capable of lifting a load of 50 tons. From this point a substantial railway will convey materials right through the building, in the centre of which a broad permanent way will run, affording the means of unloading heavy weights at any point.

The engine-houses now in course of construction are two in number, each 195ft. in length, 66ft. in breadth, and some 85ft. in height. These engine-houses are separated from the boiler-house by a massive wall of masonry, and from each other by iron pillars of immense strength, and beyond these divisions, which are required for the support of overhead travelling cranes and the several spans of the roof, nothing will exist to prevent an unimpeded view of the whole of the engines, it being intended that the engineer in charge shall have a comprehensive view of the whole of the machinery from an elevated gallery specially provided for him. In the first engine-house a pair of "small" engines of 3,000H.P. will be erected in the course of a few weeks, they being in readiness, and waiting until the roof now in course of erection shall afford them the necessary protection from the weather. These engines will actuate two Ferranti dynamos, each one capable of supplying current for 25,000 lights, by far the largest electrical generators that have yet been constructed; the largest, or, to speak more correctly, those having the highest electrical efficiency, now in actual work, being the dynamos of this same corporation at their Grosvenor station, which are what is known as "15,000 lighters." Some 60ft. overhead, above these "small" dynamos, there will be a steam travelling crane capable of lifting 25 tons, which will traverse the building from end to end. Besides the machinery above mentioned, this section of the building will also contain the condensing and hydraulic gear, exciting dynamos, and other apparatus.

In the second engine-house will be placed what the corporation's engineer justly calls the "large" engine and dynamos, of which there will be two sets. It may be confidently said that these "large" machines will be a revelation to many engineers and others who have a tolerably extended experience of "large" machines. Here the dynamos and machines are combined in such a manner that the armature, being placed on the shaft, is driven direct, and acts as a flywheel to the engines. There will be two of these large dynamos, each having its pair of engines of 10,000H.P. eventually, but at present only half the engine-power will be applied to each dynamo. At this stage each dynamo will supply current for 100,000 lights with its engine of 5,000H.P., but when the time arrives for the creation of more power by the addition of the second engine of each pair, these two large dynamos will each have their engines of 10,000H.P., and each will supply current for 200,000, and all future extensions of the plant will be in machines of this type. For the manipulation of the heavy weights in these machines an overhead steam travelling crane will be erected similar to that in the first engine-house, but with a lifting power of 50 tons.

With the exception of the roof boarding, the buildings consist solely of iron, stone, concrete, and brick, and for massive construction and strength it is doubtful if they are exceeded by any buildings in this country. Some 8,000 cubic yards of concrete and some 3½ millions of bricks have already been put in the work, and some thousands of tons of iron.

A question has been frequently asked how the electric current, when generated at Deptford, is to be conveyed to the various parts of the Metropolis. This question by no means embarrasses the promoters of this great undertaking, for in truth the answer is very simple. Current has been conveyed a distance far in excess of the distance in question on the system adopted by the London Electric Supply Corporation, and that at a time when the system had not reached the stage of perfection to which it has now attained. The current is what is known as alternating and is generated at high tension, and the mains used by this corporation, which are of quite novel construction, not only convey the current to a great distance without material loss, but what is even of more importance, do so with absolute safety, as has been clearly shown by a long and exhaustive series of experiments, undertaken with the express view of satisfying the several railway companies over whose systems the current will (by agreement already entered into) be conveyed. The current thus brought to London at several points which the corporation call distributing stations, will there be converted or transformed to a lower tension, by which process it is increased or expanded in quantity very much as compressed vapour is expanded, and thence it will be distributed to the public at medium tension by other or subsidiary mains, and again finally converted (or, to pursue the analogy, expanded) to low tension on the premises of each consumer. In all these arrangements ample provision has been made to guard against any interruption in supply that might otherwise be caused by the temporary disablement of any portion of the machinery and appliances.

THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THIS show this year includes as usual some remarkably good work, though possibly on the whole it does not surpass previous exhibitions; indeed in some respects there is a falling off from former examples of work: more particularly is this so in the artistic grouping and arrangements displayed in the picture subjects. Our interests, however, necessarily lie in the direction of architectural photographs, and while we entirely appreciate such work as Mr. Robert Faulkner's portrait of Professor Stuart Blackie by which he wins a medal, or Col. Noverre's rough drawing-paper views showing sunset effects from Penzance Harbour, we are more attracted by the singularly beautiful platinotypes of Little Moreton Hall by Mr. Richard Keene, of Derby, showing the old quad entrance porch, the gabled entrance over the moat, and several other views of this picturesque old mansion. Nothing could be more artistically rendered in photography than these charming prints. Very nearly equal to them, however, are the views by Mr. Essenhigh Corke, of Sevenoaks, from Knole House, Kent. These being interiors, are, in fact, more difficult to manage, and so deserve a correspondingly larger share of praise. They show the ballroom, the long gallery, the crimson room, and the chapel room, as well as the principal bedrooms Together a very fine set of some 50 plates in all is thus made up in illustration of one of the most complete Jacobean mansions in the country, showing the place as it exists at the present time. The largest architectural photograph in the room is a grand study of Cologne Cathedral, from the south by south-east, produced by Herr Anselm Schmitz, of that city, and for which he receives one of the Society's medals. Other views of the same church are exhibited by the same artist, including an effective interior. The detail in the bigger views suffers necessarily from the enlargement of the original negatives. From Antwerp we have the Grande Place and the Quai van Dyck, with other river views by Mr. Lyddell Sawyer; and Mr. S. R. Brewerston contributes a nice view of the garden front of Penshurst Place, Kent. Melrose and Dryburgh Abbeys form the well-known subjects which furnish Mr. R. E. Welsh's Pizzighelli prints—one of them showing Sir Walter Scott's tomb—and all of them admirable. The Temple of Concord, Sicily, and the interior of the Temple at Segesta, by Mr. W. J. Stillman, are among the best architectural studies in the room; and hanging by these is a very different type of building well represented by Mr. J. S. Hodson, F.R.S.L.—viz., St. Clement's Church, Sandwich. The sculpture series from the British Museum, with others taken at Canterbury Cathedral by Mr. J. C. Andreæ, are worth a note, and so is the interior of King's College Chapel, Cambridge, by the Rev. F. C. Lambert. Eddystone Lighthouse forms the subject of a highly-artistic picture, full of tone and rich in colour, by Messrs. F. Fry and Co.; and we also have nothing but praise for Mr. A. S. Butler's delicate study at Homburg, showing the old round tower in the Upper Town. Ludlow Castle, towering over the trees in full leaf, supplies a capital example of the artistic excellence of Mr. William Bedford's skill as a photographer, and Mr. David R. Clark, M.A., exhibits a florid interior of the Mosque of Sultan Achmet, Constantinople, nicely treated. Of the Prince of Wales's house at Sandringham Messrs. Bedford le Mere show a frame of views; but the new ballroom by Col. Edis is hardly done justice to here. The view of Lambeth Palace and Church, with the river craft to the front of the picture, by Mr. F. W. Edwards, is a freshly-rendered view of a very familiar but none the less interesting subject. Mr. J. P. Cembrano, jun., of Richmond, contributes a series of beautiful studies from the Mosche, Cordova, Spain; the Patio de los Doncellas; the Alhambra, Granada; the Hall of the Ambassadors; Alcazar, Seville, and the Patio de los Munecas. A long list of portraits of leading members of the Royal Academy is exhibited by Mr. Ralph W. Robinson, including a capital likeness of Mr. Norman Shaw. Mr. Harry Tolley, whose grand view of Exeter Cathedral we published last week, shows "A Pastoral" and "Loading Peat"—two pictures of a high order of merit. The Rev. C. Hope Sutton has been photographing at Thebes, and right well has he rendered some Egyptian Tombs in the Aristotype silver prints exhibited on the screen in this present collection. Mr. Joseph J. Ackworth, F.I.C., does good work also when away from home, and so contributes several views from Germany, Italy, and Algeria. The bits from Nuremberg and Bamberg we specially noted. Mr. J. Gale's Sussex studies are still quite the best of their kind, and his camera still produces the same beautiful work with which his name has long been associated.

THE PLUMBERS' COMPANY.

AT the quarterly court held at the Guildhall, on Monday, Mr. W. H. Bishop was re-elected Master, Mr. Chas. Hudson was re-elected Warden, and Mr. Philip Wilkinson was elected Renter Warden for the current year; Sir Algernon Borthwick, Bart., M.P., and Mr. A. Ainslie Common, F.R.S., were elected Stewards; Mr. H. P. Boulnois, Borough Engineer, Portsmouth, and Dr. John Davies, Islington, were admitted to the Freedom and Livery of the Company.

A requisition signed by the Mayor of Cardiff, the Medical Officer of Health, the principal of the University College of South Wales and Monmouth, and a large number of architects and leading citizens was presented, desiring that Cardiff should be created a centre for the examination and registration of plumbers in accordance with the Company's general system. The requisition drew attention to the facts that the population has reached 125,000, and that Cardiff has educational facilities of an exceptionally high character. The court resolved to comply with the requisition.

It was also resolved to award prizes to successful students in the plumbing classes in thirteen provincial towns.

Communications were reported from 55 boards of guardians and sanitary authorities expressing approval of the Registration system, and stating that, in accordance with the suggestion of the President of the Local Government Board, they had resolved in future to employ registered plumbers in the buildings under their control.

A second requisition was presented signed by the Mayor of Swansea, Mr. L. L. Dillwyn, M.P., and a number of representatives of the medical profession, architects, and representatives of the plumbing trade and the public, desiring that Swansea should be selected as the centre for the western district of South Wales.

The parish church of Burton-on-Trent, St. Modwen's, was reopened on the 19th inst., by the Bishop of Lichfield. The chief work of renovation has been in the chancel, which has been decorated in colour. The ceiling has been painted in gold imitation mosaic work, and bears on a scroll the words, "Spiritus Domini replevit orbem terrarum. Alleluia." The three panels of the reredos have had figures of saints carved upon them. Messrs. Powell Brothers, of London, have been responsible for the painting work in the chancel; Messrs. Farmer and Brindley, of Westminster, for the improvements to the reredos; and Mr. Tealby, of Burton, for the general work.

To celebrate the completion, after seven years, of the Wesleyan Methodist chapel at Streatham, S.W., memorial-stones were laid on Wednesday week. The church is capable of seating 1,000, and has cost £16,000.

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ILLUSTRATIONS.

LYME REGIS TOWN HALL—CLII. AND CLIV. HIGH-STREET, CAMDEN TOWN—BUNGALOWS AT BELLAGIO—PALACE AT SIENA — CHIMNEYPIECES AT OSMASTON MANOR.—OAK CABINET.—LIBRARY FOR A COUNTRY TOWN.

OUR LITHOGRAPHIC ILLUSTRATIONS.

THE TOWN-HALL, LYME REGIS.

The reconstruction of this little building was carried out last year. It originated in an offer made in 1887 by the Rev. Edward Peek to refit the interior of the Sessions Court at his own cost, in commemoration of the 50th year of the reign of Queen Victoria, if the town would undertake the repair of the fabric generally, that being in a very dilapidated state. The building as existing in 1887 (of which we give the plans), although of considerable antiquarian interest, was in many respects very inconvenient, and partly useless. The lower lock-up, for men, had been turned into a make-shift fire-engine house, and the upper one, for women, was no longer used, both having been superseded by the cells at a new police-station. The muniment room scarcely kept the valuable municipal archives from damp and mildew, and afforded them no protection against fire. The approach to the Sessions Court was by a steep and rickety wooden staircase, and its doorway was at almost the narrowest part of an extremely narrow street, in which several accidents had occurred. For these and other reasons, many of the inhabitants, led by a portion of the Town Council, had been long in favour of a scheme for having an entirely new building, and when, at an early stage of the work of repair, the dangerous condition of a great part of the old walls, floors, roofs, &c., became evident, involving the necessity for extensive rebuilding and renewal, the architect was instructed to remodel the plans, and to widen the street by setting back the front wall as far as possible. The result is the building shown in the view we publish (the original drawing having been exhibited at the Royal Academy of this year), and the accompanying plans will further explain the modifications that have been made. The work is carried out with local pebble walling and Ham Hill stone dressings, parts of the facing being of rough cast; the roofs are entirely new, boarded, felted, and covered with green slates, and the red ridge tiles are made on the pattern, slightly modified, of a few old ones that were found. In the Sessions Court all the original parts of the fittings, panelling, &c., have been preserved. They are of the 17th century, of oak, and have been carefully repaired and freed from the thick coats of paint they had received. The new parts, chiefly replacing insertions of flimsy construction and poor form in deal, are executed in best Riga wainscot, and designed to suit the character of the ancient work. The mayor's chair has a canopy, and at the back is re-fixed a carved stone panel of the Royal arms (*temp.* Charles II.), which occupied a similar position formerly. The additional wall panelling, together with the new floor, is of oak. This portion of the work was well executed, for the Rev. E. Peek, by a local builder, Mr. H. Randall. The contractor for the building, at he expense of the town, was Mr. H. T. Cooper, also of Lyme Regis, who carried out the requirements of the architect in a satisfactory manner, for a very moderate sum. The architect for the whole of the work was Mr. George Vialls, A.R.I.B.A., of Grange Park, Ealing, London. We understand that all the ancient documents in the possession of the Corporation have now been carefully examined and classified, and placed in safety in the fireproof-room provided in the upper part of the tower. The present mayor, Mr. Zachary Edwards, has brought much interest and archæological knowledge to bear upon the examination, and the collection proves to be of great value. The Corporation is a very ancient one, and of the names of mayors the list is complete from the year 1437.

BUSINESS PREMISES, CLII. AND CLIV. HIGH-STREET, CAMDEN TOWN.

These premises, just completed on the Cantelowes Prebend Estate, consist of shops with dwelling rooms over, and large workshops at rear. The fronts are red bricks, with red Mansfield stone dressings. The work has been carried out by Messrs. Gould and Brand, builders, of Camden Town, from designs and under superintendence of Mr. Edmund J. Bennett, A.R.I.B.A., Gravesend.

A SHEET OF BUNGALOWS—BELLAGGIO, EAST GRINSTEAD.

Our illustrations depict a series of English-Bungalow dwellings which have been designed for this estate, some of them being in course of completion. The chamber stories have been added to order to command the fine views above the wooded surroundings of the estate; the Bungalow Village is picturesque, and will no doubt prove attractive, situated as it is about midway between London and Brighton. The materials are hard local brindled bricks and Broseley tiles. Mr. James Mansbridge, of South Hampstead and Bellaggio, is the contractor. Messrs. Wimperis and Arber are the architects.

THE PALAZZO PUBBLICO AND TOWER DEL MANGIA, SIENA.

We published a view of the Palazzo Vecchio at Florence in the Building News for Oct. 12, 1888, and to-day, as a companion illustration, so to speak, we print a fine photograph of the Mangia at Siena. This famous brick campanile is much more lofty than the tower of the Palazzo Vecchio, Florence, but the upper stages correspond in many particulars. The Mangia was commenced in 1325, and finished after 1345. At the base of the tower is the Capella di Piazza, in the form of an open loggia or large porch. It was begun after the cessation of the great plague in 1348 (when over 30,000 persons died of the disease), and it was completed in 1376. The campanile was named after the figure of a man which used to strike the hours (a popular figure somewhat resembling the Roman Pasquino). The Palazzo Pubblico (anciently known as Palazzo della Republica) consists of four stories, and was erected between about 1289 and 1309, from the designs of Agostino and Agnolo da Siena. The building which faces the Piazza del Campo (now Vittorio Emmanuele), where the Palio races are held every year in August, and the weekly vegetable, fish, and game markets take place, is used as courts of law, public offices, and prisons. The chapel dedicated to the B.V. Mary was built to commemorate the termination of the plague already mentioned. The halls of the ancient Tribunal di Biccherua contains numerous paintings of the Sienese school by Sodoma and Pietro Lorenzetti, the ceiling being chiefly by Petrazzi, illustrating the Coronation of Pius II., the Donation of Radicofani by the same Pope, and the privileges conferred by him on his adopted city. The Sala dei Novi or della Pace, now the Archivio Diplomatico, contains frescoes by Ambrogio Lorenzetti, painted in 1337-39, representing Good and Bad Government, three pictures which give an admirable idea of the character of the Mediæval citizens of Siena. These fine works have suffered from age, and have lost their colours. The Sala del gran Consiglio, also called Balestro and del Mappamondo, is adorned by an immense fresco by Simone Memmi (1321) of the Madonna and Child under a baldacchino. The fresco in chiaroscuro of Guidoriccio da Fogliano at the assault of Monte Massi, by the same artist, is very curious on account of the great variety of engines of war introduced. In the centre of the piazza opposite the Palazzo Pubblico is the marble Fonte Gaja. The she wolf on the column in front of the right wing, the arms of Siena, dates from 1425. We illustrated the front of Siena Cathedral in the Building News for Sept. 6th last.

OSMASTON MANOR, DERBYSHIRE.

These two photographic details of chimney pieces from Osmaston Manor are from a very fine series of views exhibited at the last Photographic Exhibition held at the Crystal Palace by Mr. Richard Keene, of Derby, who has kindly sent us the following description of the house:—"About ten miles from Derby, on the road to Ashbourne, in the midst of a part where nature and art combine in forming lovely pictures with fair stretches of water, rich plantations, and hanging woods, stands one of the most magnificent of modern mansions—Osmaston Manor, the residence of Sir Andrew B. Walker, Bart. This house was designed by the late Henry J. Stevens, architect, of Derby, for the late Mr. Francis Wright, and in the style of James I. Under the direction and superintendence of Mr. Stevens and of his partner, Mr. F. J. Robinson, the building was commenced in 1846 and took several years in its completion, being executed by day-work. Large shops were fitted up, so that all the oak and pitch-pine fittings with which the house is furnished might be executed on the spot, and most thoroughly has this been done, for no better work could be desired, and the whole building, inside and out, is in the most perfect preservation. The house was originally constructed with only one large ornamental chimney, placed at a considerable distance in the rising ground in the centre of the kitchen garden; it was 150ft. in height from the ground, thus causing a powerful upward current. The flues of all the fireplaces in the house were connected underground with this great shaft, and perfect ventilation was also secured under the direction of Mr. Sylvester. The advantages were, in so large a building situated on high ground, the horizontality of the skyline was unbroken by the irregular points of chimneys, while the roofs could be used as terraces on different levels from whence the adjacent country could be viewed without inconvenience from smoke. The great chimney, with the whole of the external face of the walls of the house and offices, built of dark grey limestone obtained in the neighbourhood, had a circular smoke-shaft 8ft. in diameter. The space between the shaft and the square outer wall of the tower was occupied by cast-iron winding steps laid into the outer wall, giving easy access to the gallery at the top, which commanded fine views of the property and the surrounding country. In the year 1851 Mr. Stevens, during the progress of the work, read a paper on this subject before the Royal Institute of British Architects, which received at the time much attention, and to which we refer our readers for further particulars. After the death of Mr. Francis Wright, his son wished to make some alterations in this part of the construction, as the expense was found very great in keeping up the large draught-fires at the base of the smoke-flue. He consulted Mr. Robinson, who is still in practice as architect in Derby, in the year 1873, as to the alteration of the flues, so as to obtain separate up-draught chimneys from the upper rooms. This alteration was carried out, and the chimneys built at that time. The whole of the house chimney-flues were eventually carried up to the roof of the building, and various other alterations carried out. The great tower-like chimney was taken down, and no longer forms a feature in the landscape. This mansion, with its terraces, covers four acres of ground. Ornamental lodges, cottages, and other buildings were carried out on the estate by its founder at a cost of over £100,000. The drawing-room, commanding exquisite views of wood and lake, and beautifully terraced foreground, is 52ft. long by 21ft. wide, with large bay window. The great hall, the dining-room, library, smoke-room, the corridor and conservatory, all are worthy of note and on the same liberal scale, and no expense has been spared in their construction. A copious supply of water is secured from of the great ponds by the action of a huge waterwheel working pumps, which force the water to a high level, enough to supply by its own pressure the highest roofs in the building, and in much larger quantity than is required for ordinary purposes. Another wheel, fixed at the side of the stable wall, and supplied from this reservoir, is furnished with proper shafts and gearing for turning the kitchen jack and various appliances for abridging labour

in the wash-house, laundry, dairy, and stables. Hydraulic lifts and tramways for the conveyance of liquors in the cellars, also lend their help in lessening heavy work. Since the place came into the possession of Sir Andrew Walker a few years ago, he has beautified many of the rooms, and introduced the electric light with great advantage. It would be difficult to find a more complete or beautiful residence in the kingdom. The village of Osmaston is about a mile distant, and is reached by a fine drive through the park; the church, built at the sole expense of Mr. Wright, forming a pretty feature at the end of the long avenue of trees. It is quite a model village, and has been further improved by its present liberal owner."—Richard Keene.

OAK CABINET.

THE oak Cabinet of Dutch character which we illustrate this week is of good proportions and striking design. The main and upper portion of front is occupied by two doors, each leaf being cut up into three panels, the two larger ones raised and carved, and pierced with circular baluster work, similar to a helmsman's wheel, the smaller one being a narrow open panel, likewise filled in with balusters. The frieze over is treated in the same way at both front and sides. The deep shadows thus secured account in no small measure for the pleasing impression of the design, great relief being obtained from the richly carved surfaces of front, which otherwise would have had a rather bewildering effect.

The winged head opens with the first door, and is so divided as almost to conceal the joint, which is cut obliquely between the head and left wing; the great objection to cutting through the features is thus avoided.

This upper part, which contains three shelves inside, is brought forward on two twisted legs of bold character, likewise affording relief to the flat and rich character of the ornamentation. In the lower part are two long drawers, with carved fronts and drop-handles. The whole stands on a solid base, boldly moulded and supported by four shaped feet, another deep and effective shadow being obtained thereby.

The side is cut up into three raised panels, with simple bead round. The character of the carving, as also of the ornamental lock pieces, is shown by the sketch.

DESIGN FOR A LIBRARY AND READING ROOM FOR A SMALL COUNTRY TOWN.

THIS buiding is by Mr. E. B. Lamb, architect, 22, Doddington-grove, Kennington Park, S.E. The large public room is lighted by a large lantern in the centre of the roof (hidden by the tower in the view). The warming is proposed to be by hot-water pipes, but there is a chimney provided for a fireplace in the public room, which forms a handsome feature in the room. Accommodation is provided for about 8,000 books in the library, the centre of which could be used by the public as a reading-room for reference, &c. The cost may be roughly estimated at about 10d. per foot cube = about £3,000.

We have received one of Mr. Aspinall's lists of enamel paints, and some idea of the variety of shades may be had when we say that there are no fewer than 137 coloured samples given. Such names as Sapphire, Buttercup, Gobelin, Mouse, Fig, Shrimp, Firefly, Grass-green, Geranium Scarlet, Apricot, Pompeian Red, Hedge-sparrow's Egg, Heliotrope, Nut-brown, Poppy, Dove's Wing, Shamrock, Flamingo, Japanese Blue, Sultan, Cucumber, Canary, Sky, Holly-green are only a few amongst many; and even these fail to give an adequate idea of the great variety and beauty of the tints previously manufactured. All those who desire a better knowledge of what the colours really are would do well to write to the New Cross Works for a list, and we feel sure that it would end in their obtaining some tints of the enamels for use. Mr. Aspinall also publishes a "Guide to Aspinalling" (price 6d.), which gives some useful and necessary hints as to its application.

Memorial stones of a new church and classrooms, for the Methodist New Connexion denomination, were laid on Monday in Stamford-street, Ilkeston. The church will be a Gothic structure, providing accommodation for 560 persons, and the estimated cost is £887.

PARIS EXHIBITION AWARDS.

THE complete list of awards to British exhibitors at the Paris Exhibition has just been published. The international jury have certainly not erred on the side of niggardliness, for no fewer than 910 prizes are awarded to the 1,017 British exhibitors; of these 43 are grand prizes, 218 gold medals, 289 silver medals, 237 bronze medals, and 123 honourable mentions. The awards in architecture, in the Fine Arts Section, consist of grand prizes to Mr. T. E. Collcut and Mr. R. Norman Shaw, R.A.; gold medals to Messrs. Douglas and Fordham, Messrs. Aston Webb and Ingress Bell; silver medals to Dr. Rowand Anderson, Mr. W. Emerson, Messrs. Goddard and Paget, Mr. Leonard Stokes, and Mr. W. Young; and bronze medals to Mr. G. H. Birch, Messrs. Campbell, Douglas, and Sellars, and Mr. J. Oldrid Scott. The firms to whom awards are made in the Industrial Section include Chubb and Son's Lock and Safe Co. (gold, silver, and two bronze medals), Doulton and Co. (grand prize, two gold, and one bronze medal), Anaglyta Co. (hon. mention), Banner Sanitation Co. (bronze), Barford and Perkins (hon. mention), Farmer and Brindley (silver), Francis and Co., Limited (gold), Grover and Co., Limited (hon. mention), J. Charlton Humphreys (gold), Isler and Co. (bronze), Jeffrey and Co. (gold and bronze), Musgrave and Co., Limited (gold and silver), F. W. Reynolds and Co. (silver and bronze), E. C. Robins (gold), United Asbestos Co., Limited (two bronze), W. Watson and Sons (two gold), William Woollams and Co. (gold).

CHANCERY-LANE SCHOOL OF ART.

THE annual exhibition of students' works at the Birkbeck Institution, Bream's Buildings, Chancery-lane, opened to the public last Monday and Tuesday, is a satisfactory record of progress. Since the commencement of this art class in 1882 the standard of proficiency has been raised. The day-school is attended by forty students on the average, while the evening school has quite double that number. Many of the students have a direct interest, and are trying to obtain an art-teacher's certificate; others have technical work and manufactures in view. The successes at the recent Government examinations show a high average. The second-grade passes for elementary drawing number 90, and the third-grade for advanced drawing, painting, &c., 70. No less than 51 works are accepted for certificates. Of first-class certificates there are 44, made up of second and third-grade, and for complete art teaching certificates there are 5. The prize awards are equally promising. One silver medal, one bronze medal, and one book prize have been awarded in the national competition; there are 16 third-grade prizes, and 10 second-grade. Three students of this school obtained studentships at South Kensington, one at the Royal Academy, and one is working under Professor Herkomer at Bushey. Referring to the several local prizes competed for, we may mention that the first Mason prize was won by H. Black, the second by A. N. Chettoe. The prize offered by Seymour Lucas, A.R.A., for an original sketch, has been given to H. C. Pocock for a figure subject in chalk. The other students who have creditably competed are Kate Sowerby, Annie Hall, H. W. Clarke, H. W. Hadwen, C. E. Bloom, E. T. Holding, E. J. Miller, W. J. Smith, and F. C. W. Culver. The sketches by the latter in landscape are creditable. Those of E. J. Miller, who takes the Mason prize for landscape, include a sketch of "A Windy Day," in which there is much freshness and nice colour; and one of Raleigh House, Brixton, amidst its trees. Other water-colour sketches made in the Sketching Club indicate careful instruction, nice colour, and handling. Amongst the several subjects we see in the room we can only notice here a cleverly-shaded Early English capital by Lily Friston, and another by Hookham. A little girl seated is a pleasant and naturally-drawn figure subject, by Annie Hall. A water-colour group of green vase and dish and drapery, by Langham, is certainly the best work of the kind exhibited, both in the delineation of texture and the treatment of colour. The sketches of old man's head, in the three hours' time painting from life, deserve notice; also some of the oil studies of heads and figures from life. A fine water-colour drawing of an acanthus and a skilful adaptation of the same plant for ornament, by Louise Aumonier, are in the collection. Shaded models, by Miss H. Williams and W. Fuge, deserve mention, also some heads in chalk. F. H. Andrews has a design for wall paper, one of the only works of this class, the design rather Persian in character. Frank Gast is also a competitor, and is placed second. In the list of awards, the second-grade freehand include first-class works by Lottie Jacobs, Philip Reviers, W. H. Scrivener, A. Wadham, Alfred Evans, Arthur Foale, Harriet Ladds, and T. Withers. The second-grade models include Kate Sharpe, A. Wadham, T. Withers, and Arthur Busvine as first class. The second-grade perspective comprise in first class the names of Grant, Lily Friston, Scrivener, and Finch; outline from casts, H. W. Clarke, whose work is excellent, and Lizzie Jacob. In the shading from models, Lily Friston, Amy Ladds, and seven others. In still-life painting, Ellen Hockley and Kate Sowerby are placed first-class, and Minnie Brooks second-class. The antique include the names of H. Black, S. James, H. Pocock, John S. Rogers, and Harriet Sutcliffe, all first-class. The life studies comprise the names of Margaret Bowman, H. Black, J. Percy (excellent), and R. Sowerby as the leading students. We should like to see decorative designs more sought after, and we are glad that day and evening classes for this object are given, and that a course of lectures by Miss Louise Aumonier is to take place. Taking the results of the year's work under the head master, Mr. Alfred W. Mason, this exhibition is very successful and promising.

CHIPS.

The new markets at Carlisle were opened on Wednesday. The style of the buildings is Composite, and at the north-west angle is a Jubilee tower 100ft. in height. Messrs. Cawston and Graham, of London, are the architects, Messrs. Hodgson, of Workington, the general contractors, and Mr. H. C. Charlton is the clerk of works.

The new theatre at Exeter, built on the site of the one destroyed in the calamitous fire of Sept. 5, 1887, will be opened on Monday next. It has been erected, from plans prepared by Messrs. Alfred Darbyshire and F. Bennett Smith, by Mr. W. Dart, of Crediton, and was illustrated in our issue of March 5 of the present year.

Bishop Kelly, of the diocese of Moray and Ross, opened on Friday a new school, which has been erected in connection with the orphanage at Aberlour. The school, which is close to the orphanage, has cost £2,500. The design, which is after plans by Mr. Ross, Inverness, who has been the architect of the whole block of buildings known as the Orphanage, as well as of the Gothic chapel which stands close by, harmonises with the other buildings. A feature of the school, which provides places for 210 children, is a tower 50ft. in height, which is furnished with an illuminated clock and a peal of bells. The two principal classrooms are 60ft. by 20ft.

The parish church at Mydrim, near St. Clear's, Carmarthenshire, will be reopened on Tuesday next. The church has been restored and reseated; an organ-chamber and vestry have been added, a heating apparatus provided, and a pulpit and lectern worked in oak, passages laid with tiles and other minor works carried out under the direction of Messrs. Kempson and Fowler, architects, of Llandaff. The chancel has at the same time been restored by the Ecclesiastical Commissioners.

The foundation-stone of a new club at Cwmaman was laid last week by Lady Aberdare. The church will cost about £850, and will be built with native stone and Bath stone facings. Its length will be 59ft. 6in., whilst its breadth will be 29ft. 2in. The plans have been prepared by Mr. E. M. Bruce Vaughan, Cardiff, whilst the contract has been taken by Mr. John Haines, of Canton, Cardiff.

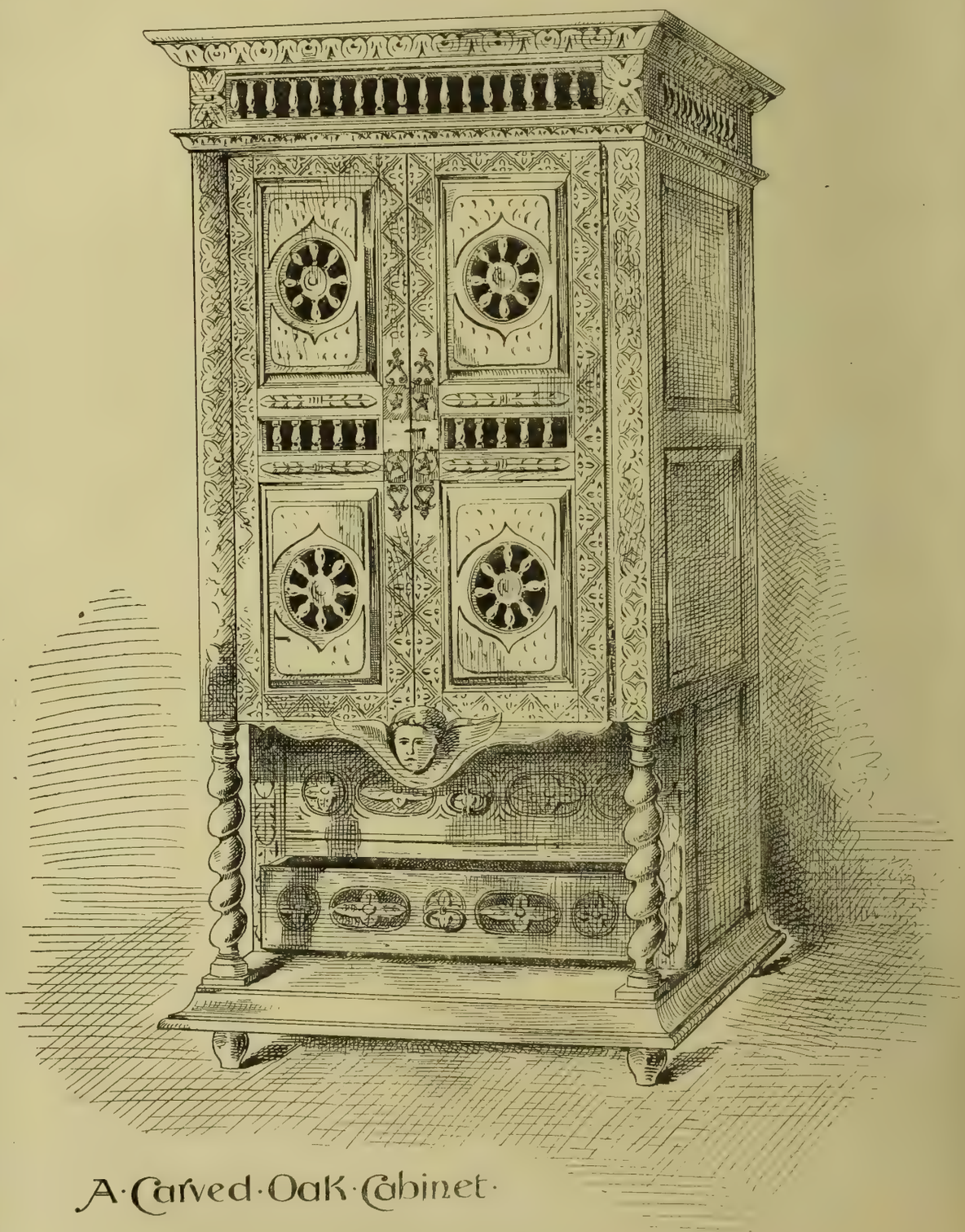
The prize of 100,000f. for the best work in the Paris Exhibition has been awarded to the architect and constructors and workmen of the machine gallery. M. Duttert, the architect, will probably be allotted 20,000f.; M. Condamin, the assistant architect, 15,000f.; the five engineers, 3,500f. each; and the workmen the remaining 47,500f.

At Plymouth, the foundation-stones were laid, on Monday, of Art, Science, and Technical Schools, which are to cost £5,000, and form a memorial of the Queen's Jubilee. Mr. Shortridge, of Plymouth, is the architect, his design having been selected in competition.

The memorial statue of the Right Hon. W. E. Forster, to be erected in the centre of Forster-square, Bradford, has been completed by the sculptor, Mr. Harvard Thomas, of London. The figure is 9ft. in height, and represents the educationist with uplifted hand.

At the Sale Rooms

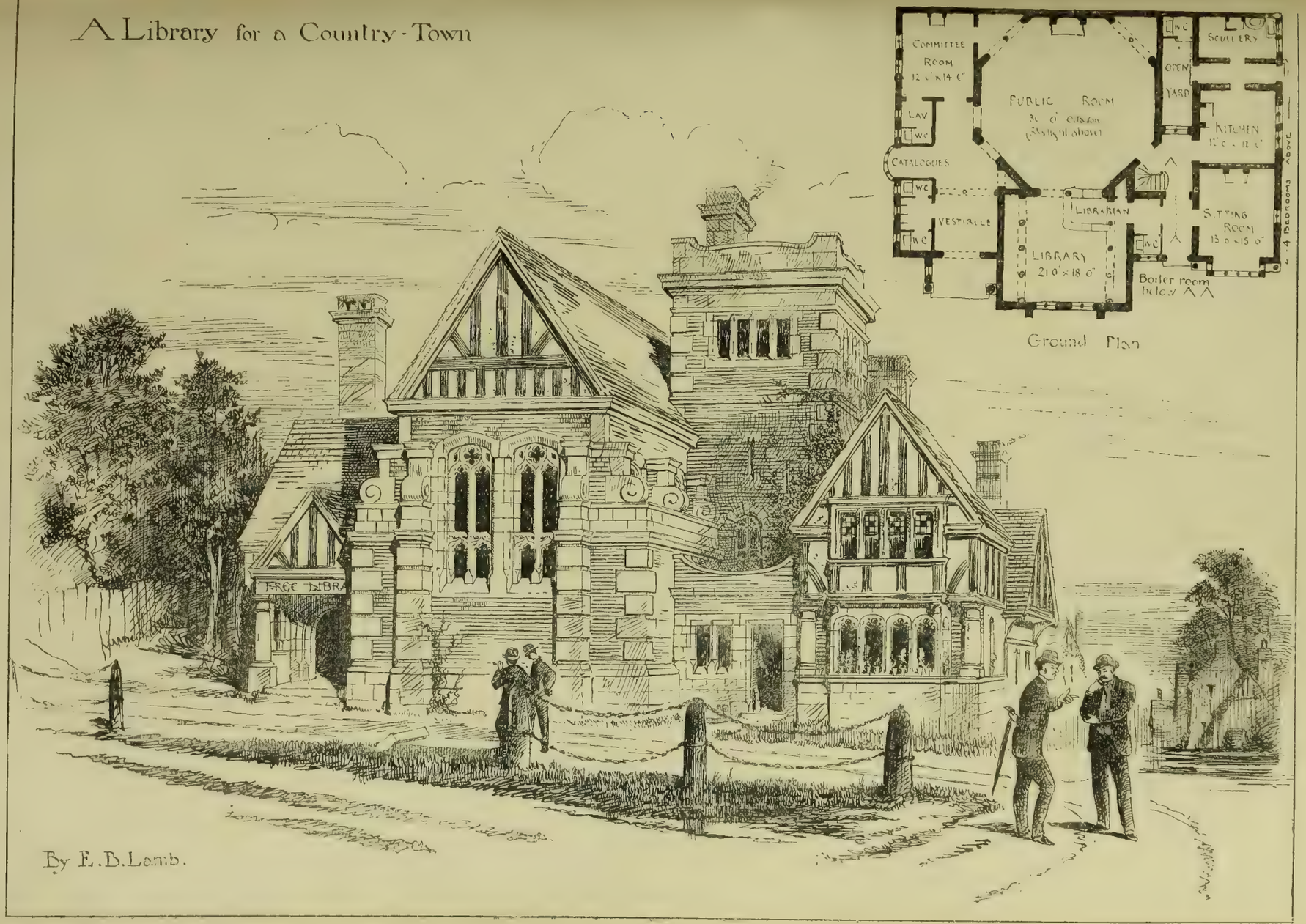
of Messrs Christie Manson and Woods



A Carved Oak Cabinet

E. Chancellor del. Aug.t 89

A Library for a Country-Town



Ground Plan

By E. B. Lamb.

WAYSIDE NOTES.

THERE should be no necessity for anyone to insist upon the importance of cleanliness and perfect sanitary arrangements in establishments devoted to the manufacture of that bread which is the "staff of life," and which, as the Psalmist says, "strengtheneth man's heart." Yet, seeing that the dirt and disreputableness of many of the London bakehouses has long been a by-word, and that we are periodically disgusted with the details of their management, proclaimed by individuals who, it is to be supposed, have had more than ordinary opportunities for observing the true state of things—having regard to this condition of affairs, it would seem that some agitation is needed for reform in the inspection of bakeries. If Mr. John Burns did no other good during the late dockers' strike, his description of London bakehouses, be it mild or exaggerated, was certainly a seed-sowing that may bear some fruit. Parties taking up their *Times*, *Standard*, or "*D. T.*," &c., on the morning succeeding his exhortation touching the condition of London bakehouses, must have been all but ill at their breakfast tables. So, also, many will have been nauseated by the words of Dr. Dudfield, Medical Officer of Health for Kensington, in describing the condition of a large section of the bakeries in this fashionable suburb. In his annual report the doctor says, "Almost any kitchen or cellar is turned into a bakehouse, often in close proximity to drains, many being even undrained, and totally unfit places for the manufacture of human food." This really points to a very wide-spread existence of a filthy state of things that ought, at an early date, to be the subject of Parliamentary inquiry and legislation.

From a perusal of this report of Dr. Dudfield, one learns that the present state of the law with regard to the inspection of bakehouses is passingly feeble and inadequate. It appears, indeed, that, in this respect, we are worse off at the present time than we were some years ago, when the duty of inspecting bakehouses rested upon different shoulders to those which it now does. All I can say is that it is a disgrace to the nation that it should be so. There is no reason in the world why a bakehouse should not be perfectly sweet and clean; a good one is always so, and is a pleasure to behold. One would think that, considering the growth and development of large bread-making companies, the little bakers would, in their own interests, have had their bakehouses spick-and-span. Experience, however, shows that they are utterly callous on this score, and as the few clean and sweet bakeries cannot make enough bread for all, the filthy ones ought to be strictly controlled by law, or swept away altogether. Legislation should be provided for the control of their arrangements and the strict supervision of every detail connected with the making and baking of the bread. And I do not think that in this matter my opinion is different from the great body of the British public, who, though not perhaps sufficiently roused to take active measures, are yet becoming alive to the necessity for reform in the arrangements, conduct, and supervision of bakehouses in general, and those of London in particular.

With the autumnal equinox gone by, we begin to anticipate the peculiar delights incident to our November fogs. We can sympathise to a great extent with the inhabitants of Newcastle and other cities with smoke-laden atmospheres. Perhaps for a manufacturing city pure and simple, such as Newcastle, there is less present hope to be rid of the nuisance. In London, however, with its myriads of chimneypots to ordinary house-fires, much might be done to lessen the blackness of the fogs that we may now expect at any time. I was glad to notice that something is still being done in this direction. The demonstration held early this week at Willis's Rooms, St. James's, is encouraging in its way, although any scheme for chemically treating fuel does not seem based on such sound principles as that which relies upon the construction of stoves that will consume all, or a large part, of their own smoke. In the demonstration given by the Smoke Abatement and Fuel Saving Company, the principle adopted was to steep the coal in a chemical solution at the cost of 6d. per ton. According to the reports of the demonstration, a fire fed with this chemically-treated coal gave off little smoke as compared with one fed with ordinary coal. Whatever the result, however, and commendable as may be the efforts of the company that gave the demonstration, the principle seems wrong. Stoves and furnaces consuming their own smoke would appear to be the right track to go upon in an endeavour to abate the smoke nuisance—a difficult question at the best. For, supposing a perfect grate, stove, and furnace be invented, where is the benefit to come from its use, unless its adoption be enforced by municipal authorities? A small percentage adopting the new stove would affect neither for good nor ill. The only way to progress in the matter, short of Government interference, is to produce a smoke-consuming register-stove that will also lessen the householder's coal-bill. Progress even in this direction would be but slow, as there are more or less imperfect stoves of this nature in the market. Unfortunately, a fashionable grate at the present date is wasteful of fuel, and gives out little of the whole heat produced. The vast majority of register stoves now being fitted up in houses are wasteful in every way, being set deep in the wall, and having no firebrick back sloping forwards. There is imperfect combustion, little absorption and radiation, and a large percentage of the rays of heat are cut off by deeply recessing the stove into the wall.

Look out for a competition at Croydon! It was generally reported on Tuesday that the Croydon town council had, besides applying to Parliament for the necessary powers to purchase by compulsion certain properties in High-street, Middle-row, and Surrey-street, with a view to improvements, also acquired the Central Croydon Station of the Brighton Company, upon which it is decided to erect a town hall and municipal buildings, including a free library. The corporation are going to borrow £100,000; but I am not sufficiently "up" in local affairs to say how much, if any, of this money is to be set aside for the new buildings, or even whether or no there *is* to be a competition for the work. Anyhow, the building will be of such size as to make the affair worthy of the attention of the retail class of competitor, should there be an open competition.

I found myself at the venerable city of Worcester at the beginning of the week, and although, being Sunday, I had no opportunity to see the Health Exhibition, holden therein under the auspices of the Sanitary Institute, I did gather a piece of information that should interest "Ars," and all your readers who noticed his challenge to produce an individual who had "lavished" as much as Lord Grimthorpe upon a cathedral or abbey. If the aged verger truly informed me—and remembering his noble mien and mild eye, I cannot find room to doubt his words—the late Lord Dudley has expended a sum exceeding one hundred thousand pounds upon various works in connection with restoring, refitting, seating, glazing, and organ-building at Worcester Cathedral. The exact sum, in round numbers, is, I was given to understand, £135,000. I put this forward as told to me by a man in whose veracity I should have perfect confidence from the mere expression of his countenance. It is for any who may be so inclined to endeavour to show that the amount is exaggerated.

Being, when I last wrote, among the grandest scenery in Yorkshire, where the rugged moorlands compass one about, and the lovely Wharfe flows merrily below, I did not have the patience to spend time replying to Messrs. Longmire's remarkable effusion in your issue of the 20th Sept., so now, as promised, bring it under consideration. To begin with, your correspondents need scarcely have taken so much trouble as to go out of their way to misconstrue the meaning of the term "saddle" as employed by me. It must be patent to all who have followed the discussion how Messrs. Longmire have hugged this "ancient painted ceiling" till, in the face of more important issues, their action has become ridiculous. Mr. Gough made a statement, and they wanted *me* to explain it; if I was not justified in terming this a *saddling* I should like to know the reason why. The extraordinary part of Messrs. Longmire's letter is the mysterious hinting at destructive deeds done at the abbey. At what time they do not state; but after puzzling over this portion of your correspondents' letter, and reading it through several times, I can only come to the conclusion that they would endeavour to convey an impression to the minds of your readers that the ancient "Goth," whilst visiting St. Alban's Abbey, carried with him a "jemmy" or other iron instrument, after the manner of Bill Sykes when equipped for a burglarious expedition, and proceeded, in cold blood, to deal such damage to the fabric of the Abbey as should justly earn for him a "month, without the option," "wrenching off the carved pateræ on the new oak lobby-screen, and smashing off the cusps on St. Cuthbert's screen"! Furthermore, that the damage so wrought was connived at by "the attendants at the Abbey"! That is what I make out of the mysterious allusions in Messrs. Longmire's last letter to you, and very extraordinary it must appear to your readers, who, on reading the letter, cannot well help drawing similar conclusions. Perhaps your correspondents will speak out like men, and say frankly whom they would charge with descending to the miserable littleness they mention?

I see plainly that it will soon be useless to continue argument with the advocates of Lord Grimthorpe's work at St. Alban's. It is a mere bandying of words. Happily, this discussion has done immense benefit to our cause, in making more widely known the nature of the "restorations" being carried out. The ill-fame of the frightful transepts which "the attendants at the Abbey" blush to show to the visitor to the once noble church has spread far and wide. It is upon these transepts that all hope for the future rests. Had the old transepts been merely restored, Lord Grimthorpe would have been safe and secure in his position; as it is, they will, in all probability, prove monuments to mark the time when his lordship and the Abbey parted company. I trust that Mr. Gough's memorial will be widely circulated and signed in large numbers, so that a mass of signatures may be procured before the date fixed for the litigation *re* the restoration of St. Alban's Abbey.

I have to thank the gentleman who forwarded the *Barry Dock News*, and the note anent the architects' and surveyors' advertisements therein. But I could show him a London paper with an infinitely more objectionable advertisement in it; and advertisements of a far lower standard are common enough in provincial and seaside papers. In the matter of architects advertising, I fear we shall go from bad to worse: witness the increased practice of architects—big London architects, too—sticking up signboards on the scaffolding of buildings being erected in important new thoroughfares. This was a practice wholly unknown some few years ago. Unless some strong bonding together of the profession takes place—unless both registration and federation be taken up energetically and thoroughly, the status of the profession must inevitably be lowered by the tone and frequency of the advertisements employed by many of its members. Perhaps in the general levelling, or dragging-down, that it is said is taking place in every way, we shall still hold a similar position with relation to other businesses, or to the general social scale; perhaps we shall descend and become tradesmen first and architects after, as in America. Happily for young architects, the world and humanity remain the same whatever outward and visible changes take place, and they, by keeping out of the mire, can, with perseverance, create for themselves practices as refined and of as high a class as any that have ever been. It may be too, that the advertisers do less harm than we may think, for the educated public know well enough that, though both are architects, there is *just a little* difference between, say, Mr. Norman Shaw's social position and that of Mr. Juggins, architect and pigsticker, who advertises in the columns of the *Jerrybilton-on-Sea Gazette*.

GOTH.

At the Church of St. Michael, Coxwold, Yorks, a stained-glass window, erected by Sir George Orbey Wombwell, Bart., to the memory of his eldest son, the late Mr. George Wombwell, was unveiled on Friday. The window is the work of Messrs. Cox, Buckley, and Co., of London, and is divided into three lights. The subject of the centre light is the Crucifixion, and the side lights are occupied by figures of St. John and the Virgin Mary. Above the middle light, and in the centre of the tracery, which is in the Perpendicular style, is a representation of St. Michael, to whom the church is dedicated, holding a scroll. At the base of the window is an inscription. The stonework has been executed by Mr. Cornforth, of Coxwold.

Building Intelligence.

Bow, Devon.—The corner-stone of the new chancel of the parish church of Bow was laid on Friday. The church dates from about 1300, and had fallen very much into decay. About 30 years ago the then rector of the parish built a chancel, the designs of which were drawn out by the village blacksmith. It was built square, with an open deal roof and lancet windows. The incongruity of such an addition to a Mediæval building, and the fact that it was not large enough to contain the choir, led the present rector to take steps to have the structure replaced by a chancel suitable to the requirements of the church. The plans were prepared by Mr. Medley Fulford, of The Close, Exeter, and the building work has been intrusted to Messrs. Green and Ash, of Okehampton. The chancel will be entirely rebuilt and lengthened eastward. The walls are to be built of Itten Moor stone, the windows and other dressings of Hatharleigh stone, and the roof will be ceiled and panelled in oak. On the south side there will be an organ-chamber. The choir seats, altar, and other chancel fittings will be of oak. The nave roofs have been restored *in situ* with oak, and will be boarded and slated. The floor under the seats will be of wood blocks on concrete. The passages will be tiled, and the new seats will be oak, the old oak panelling from the former seats being worked in and used as a dado against the walls. It is intended, when funds permit, to restore the west tower, screens, &c., and build a vestry, with heating chamber underneath. The church will accommodate 195 persons. The cost of the present work is estimated at £800.

Brighton.—The substructure to the new chancel for the Parish Church, Brighton, is approaching completion. The tender for the work was let to Messrs. Lynn and Sons, of Brighton, for £1,964, in addition to the work already executed by that firm for footings, concrete, and excavation. The substructure is entirely vaulted, and contains a large clergy vestry, waiting-room, clerk's room, muniment-room, and lavatory. The exterior is entirely faced with Portland stone, and stands some 7ft. above the ground level, the chancel floor being raised over the nave of the existing church, which is well above the adjoining streets. The dedication stone of the new work is to be laid by the Bishop of Chichester on the 28th. The stone is supplied by Messrs. Trask; the clerk of works is Mr. Shelmerdine; the architects are Messrs. Somers Clarke and J. T. Micklethwaite, Dean's-yard, Westminster.

Cardiff.—St. John's Parish Church was reopened on Wednesday week, after enlargement by the addition of outer north and south aisles to the ones to nave, and a vestry, and also general restoration. The south aisle, which is the wider of the two, will seat 400 persons, and the north aisle about 200 persons. The mountain limestone with which now the entire church, save one small portion, is externally faced, gives tone and warmth of colour, and harmonises with the grey lias of the tower. The windows of the old north and south walls have been reset in the new aisles. The galleries have been cleared away. The whole of the seating has been remodelled, a passage made up the centre, and the passages tiled. The roofs have been thoroughly restored. The old plastering in the panels has been taken away, and wood substituted; but nearly all the old oak principal rafters have been made use of again, as well as the ribs which show in the nave and old aisle roofs. The tower arch has been opened out—a fine feature in the building. The rood-loft turret has been kept intact, and carried up to form an entrance to the gutters. The arch to the organ-chamber from the east end of the old south aisle has been raised about 8ft. higher than it was. The church has been fitted with new gas arrangements and with channels and gratings for heating the whole of the church. Messrs. Shepton and Son were the builders. The tiled floors were supplied by Messrs. Godwin and Sons, Withington. Messrs. Kempson and Fowler, of Llandaff, were the architects.

Douglas, Isle of Man.—New board schools in Hanover-street were opened recently by the Lieutenant-Governor. The building is carried up three stories in height, the total accommodation provided being for 800 children, in addition to which are a cookery class and technical classrooms for another 80. The ground floor is devoted to the infants' department, the first floor to the girls', and the boys' department, with separate entrance, is arranged on the upper floor. In the girls' department, four class-rooms are provided for 60 each, the two central ones being convertible into one by sliding screens, and teachers' rooms, lavatories, cloak-rooms, and cookery class-room, 22ft. by 18ft., are also provided. In the boys' department, the accommodation is similar to the girls' department with the exception of cookery class-room, in lieu of which a technical class-room is provided. On the ground floor are situated clerk's office, also board-room, 22ft. by 18ft., which will be fitted with oak furniture. The school and class-rooms throughout are heated by means of "Galton" open fires, and the oak "dual" desks are fitted up throughout the building. The internal woodwork throughout, including floors, is of pitch-pine, varnished. The exterior of the building is of plain design, and is faced with red Ruabon bricks, relieved by terracotta dressings. The windows on the ground floor are arched with flat Gothic arches, having label moulds over, the joints and arches of all windows and recesses being moulded and stopped. The contractor for the works was Mr. William Kelly, of the Bridge, Douglas. The building has been carried out under the personal supervision of the architect, Mr. Thomas W. Cubbon, of Birkenhead and Douglas, who has also been appointed architect for improvements at the Tynwald-street Board Schools; Mr. Mark Carine acting in both instances as clerk of works.

Liverpool.—The foundation-stone of the Balfour Institute in Smithdown-road was laid on Saturday. The front portion contains the main entrance to the Institute, with the staircase and two floors of classrooms, reading rooms, library, &c. Five shops on the ground floor can be altered into additional classrooms when required. The back portion of the building has a gymnasium on the lower floor, 20ft. in height, with lavatories, and a technical schoolroom, 36ft. by 16ft. On the upper floor is a meeting hall, with large gallery at one end, seated for over 600 persons. The exterior walls are of grey brick, with red Ruabon window jambs, and stringcourses, and terracotta panels and enrichments. The doorways and gable copings are of red stone, and the roofs of slate, with red ridges and lead finials. The staircases are of granolithic stone, and have glazed tile dadoes. All the latrines and lavatories are lined with white glazed tiles, and have cement floors. The hall has boarded ceiling with coved sides, and principals with moulded ribs and braces, and the whole building is warmed by hot-water pipes on the "small-bore" principle. The gymnasium is lighted from the north side by means of Hayward's lights, and is floored with solid wood blocks. Messrs. F. and G. Holme, of Liverpool, are the architects, and Mr. Thomas Urmson, of Soho-street, is the general contractor. Messrs. Henshaw and Sons are contractors for the brickwork. The red bricks and terracotta are supplied by Messrs. Monk and Newell, Ruabon, whilst the masonry is being executed by Mr. Wood, of Everton. The cost will be £8,000.

Roslin, N.B.—The parish church of Roslin, which has been closed five months for repairs, was opened on Sunday. The improvements are mostly in connection with the interior; but some little alterations have been made in enlarging the porch and access to the vestry. The alterations have effected a great change on the aspect of the interior, an open timber roof having replaced the old low plaster ceiling. The addition of a choir gallery over the inner porch and a new pulpit and its accessories have given variety to the plain proportions of the interior. The windows also have been renewed and glazed in panels of cathedral glass and tinted borders. The furnishings are all repainted, and the walls tinted a Bath-stone colour with calcarine, and lined with red lines. The ventilation and heating have also been attended to, and the artificial lighting of the building is accomplished by five coronas with Jones and Willis' cathedral lamps. The works have been carried out by Messrs. Steven and Stoddart, of Bonnyrigg, under superintendence of the architects, Messrs. Hardy and Wight, Edinburgh.

West Blatchington, near Brighton.—This church, dating at least from the 12th century, was long since reduced to ruins; the west wall, with the little round-headed lights therein, and part of the north and south walls being left. By the munificent legacy of one whose family had been connected with the place for several hundred years, the work of reconstructing the building has been commenced. The building had been used as a fowl-house and faggot repository, and the walls were in part thrown down, and in parts patched with flints, &c. These accretions being removed, the walls proved to be in so tottering a state that it was necessary at once to run cement grouting into them, and provide for external buttresses to take the weight of the roofs—yet to be put on. Thrown into an ancient grave, were found the remains of the small, round-headed chancel arch, and, at the west end remains of foundations were revealed, which seem to indicate that a lengthening of the church was intended to be done, but never carried out. Foundations of a S. aisle were revealed; but no indications of arches opening into the nave. All the fallen pieces of stone have been preserved, and are carefully sorted. The work of renovation has been placed in the hands of Mr. Somers Clarke and J. T. Micklethwaite, and will be carried out by Messrs. Geo. Lynn and Sons, of Brighton.

CHIPS.

Professor Heeley, of Capetown, has accepted a permanent Government appointment, as head of the Geological Department for the survey of Cape Colony.

The Sheffield Town Council have appointed a special committee to consider the powers of the corporation for providing or improving the dwelling accommodation of the labouring classes, and to report thereon. A motion by Mr. Stuart Uttley declaring it to be desirable that committees should endeavour to secure that all contractors under the corporation pay a fair rate of wages, and observe such hours of labour as are just and fair, was negatived by 26 votes to 20.

A new school-chapel at East Barry will be opened on Sunday next, to accommodate the population which is rapidly gathering round the new Barry Docks. It is of brick and stone, and has been built by Mr. T. A. Walker, the contractor for the Docks.

The Bishop-Suffragan of Beverley (the Right Rev. R. J. Crosthwaite) unveiled on Monday two stained-glass windows at Brafferton parish church, about three miles from Boroughbridge. One of the windows, placed at the east end of the chancel, has cost £200. The subject is "Scenes in the first Forty Days after Our Lord's Resurrection." The second window is a smaller one, and the subject is "The Garden of Gethsemane." Both windows have been put in by Mr. C. E. Kempe, of London.

Mr. H. T. Margetson, of Chelsea, has been commissioned to erect a marble monument to the late Mrs. Brickwood, in Portsmouth Cemetery, at a cost of £1,000.

A new hop-store has been erected for Messrs. Mann, Crossman, and Paulin, and special attention has been paid to the ventilation, the extraction of the vitiated air being effected by Messrs. Robert Boyle and Son's latest improved patent self-acting air-pump ventilators.

It has been decided to fill the west windows of Croydon parish church with stained glass as memorials to the late vicar—the one to contain a large scene, running through the three lights, of the Resurrection, with three smaller subjects beneath, of events immediately following, and the other window treated in the same way with a large scene of the Ascension, and similar subjects below. The whole of the design and execution has been intrusted to Mr. A. O. Hemming, of 47, Margaret-street, Cavendish-square.

The ventilation of the extensive new stables and laundry buildings at Byrkley Lodge for Mr. Hamar Bass, M.P., has been carried out on Kershaw's system, the patent inlet and air-diffuser being adopted for the supply of fresh air, and the patent pneumatic ventilator for the removal of vitiated air.

The London County Council decided on Tuesday to seek Parliamentary powers to acquire and remove the whole of the south side of Holywell-street, so as to widen the Strand in its narrowest part between the churches of St. Mary and St. Clement Danes. The cost is estimated by Mr. Blashill, the superintending architect to the Council, at about a quarter of a million.

A scheme of water-supply works, prepared by Mr. A. Hennessy, M.Inst.C.E.I., of George-street, Limerick, has been adopted by the town commissioners of Listowel, and will be carried out forthwith in three contracts, the first comprising the construction of sluices, watercourses, and reservoirs, and the laying of water-mains; the second the supply of mains and sluices; and the third that of turbines and pumps.

Engineering Notes.

Hartlepool.—The new sea-wall inaugurated by Lord Londonderry last week, extends from the east end of Corporation-road to the Heugh Lighthouse, a length of 3,400ft.; it follows a uniform curved outline, and is 17ft. 8in. in height above high-water mark. Plans were prepared by Mr. Howkins, consulting engineer to the Commissioners, and by Mr. H. Mair, then the borough engineer and surveyor of Hartlepool. The former was for a wall, which should hug the cliff along the entire length; the latter was to throw out a wall to a uniform line, and the latter scheme was adopted. The design was curtailed from an estimated outlay of £27,000 to one of £22,000. 103,000 cubic yards of filling were deposited between the wall and the rocks, while 14,000 square yards of asphalte were used in the construction of the promenade. The amount of land saved by the formation of the wall is about 3 acres 14 perches. The promenade works were originally designed by the then borough engineer, Mr. Hugh Mair, C.E., who superintended them up to the time of his taking office as surveyor to the Hammersmith vestry, London. Since then they have been carried out by his successor, Mr. H. C. Crummack, Assoc.M.Inst.C.E. The total cost of the wall has been £25,000. On an average 100 men have been kept employed during the work, and they were assisted by seven steam-engines, including two locomotives. Mr. T. A. Matthews, of Bolton, was the contractor. Latterly, Mr. Matthew Longstaff, of Hartlepool, has been the clerk of works in succession to Mr. Stead, also of Hartlepool.

CHIPS.

The foundation stones of a village chapel were laid at Lavister, near Rossett, Cheshire, on Wednesday week. The chapel will be seated for 150 persons, and is being built by Mr. Thomas Huxley, of Malpas.

A mass meeting of plumbers in the western district of London is announced to be held on Thursday, 10th October, at 5.30, at the Town-hall, High-street, Kensington, for the purpose of considering the registration of plumbers promoted by the Worshipful Company of Plumbers.

The Royal Archæological Association of Ireland have this week been holding their autumn meeting in the lecture theatre of the Royal Dublin Society's House, Dublin. Lord James Wandesford Butler, D.L., is the president. Papers have been read by the Bishop of Down, General Stubbs, and Messrs. W. F. Wakeman, G. H. Hinahan, W. Frazer, J. L. Robinson, A.R.H.A., and Thomas Mason. The subjects comprise "Megalithic and Celtic Remains," "The Unrecorded Figure of Mevagh," "Ancient Sculptured Crosses," "The Antiquities of Dromiskin," and "Ecclesiastical Archæology of Ireland." Yesterday an excursion was made to New Grange, Dowth, Slane Abbey, Mellifont Abbey, and Monasterboice.

The Croydon town council unanimously resolved on Monday to apply to Parliament for powers to purchase by compulsion property in High-street, Middle-row, and Surrey-street, in order to widen the High-street, and abolish a series of rookeries behind. The scheme will cost at least £100,000, and has been before the local authority nearly 30 years. The council have already decided to acquire the Central Croydon Station of the Brighton Company, and land adjoining, to erect a town hall and municipal buildings, including a central free library.

The Henry-Smith High School at Hartlepool, opened last week by Lord Londonderry, has been built from designs by Mr. G. Gordon Hoskins, of Darlington. It is Renaissance in style, constructed of red bricks with terracotta dressings, and is planned on the hall-passage system. The chief contracts, those for excavating, drainage, brickwork, terracotta, masonry, and ironwork, were taken by Messrs. J. W. and M. Mackenzie, of Darlington. Mr. Joseph Hindmarch was the clerk of works.

On Saturday a monument in the form of a bronze bust, placed on a pillar and block of red and black granite, with a pedestal of grey granite, was unveiled in Maryhill Church, near Glasgow, to the memory of the late Rev. W. S. Shanks, who was parish minister for 28 years. The memorial cost about £100, and the bust is the work of Mr. P. Macgillivray, sculptor, Glasgow.

The statue of a god, in a sitting posture, has been discovered at Tripolitza by a member of the French School of Archæology at Athens. The style of the art approaches that of the antique Egyptian sculptures. The statue is supposed to be the most ancient yet discovered in Greece.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Architectural Association.—The following is the syllabus of meetings for the session 1889-90 of the Associatiou:—

Oct. 4 (to-night), Opening Conversazione at Westminster Town Hall; Oct. 18, Annual General Meeting, address by the President, Leonard Stokes; Nov. 1, "The Treatment of Angles and Enclosing Lines," F. T. Baggallay; Nov. 15, "The Paris Exhibition," Banister F. Fletcher (Cates Student); Nov. 29, "The Decoration of Churches," E. Pridham Warren; Dec. 13, "Drawing," Reginald T. Blomfield, M.A.; 1890, Jan. 3, "Spires, Towers, and Domes," Sydney B. Beale; Jan. 17, Discussion on "The Progressive Examinations of the R.I.B.A.," opened by Arthur Cates; Jan. 31, "Free Libraries," E. W. Mountford; Feb. 14, "An Account of some Typical Greek Buildings," R. Elsey Smith; Feb. 28, "Architecture in Oxfordshire," W. A. Pite; March 14, "Modernism in Art," Henry Holiday; March 28, "Hospitals," Keith D. Young; April 18, Members' Soirée, assemble at 8 p.m.; May 2, subject to be announced, Alfred Gilbert, A.R.A.; Nomination of Officers; May 16, The Travelling-Student's Notes, A. E. Bartlett; Election of Officers.

Medical Officers of Health Society.—The annual meeting and conference of the Society of Medical Officers of Health were held at the Guildhall, Worcester, on Saturday, under the presidency of Professor W. H. Corfield. Dr. H. Swete read a paper on "The Actual and Probable Effects of Recent and Prospective Legislation upon Medical Officers of Health." The salaries of such officers, he stated, ranged from £1,000 to £3. He proposed to make the minimum £100 per annum, no private practice to be taken when a medical officer of health received a higher salary than £300. Dr. Taylor, Liverpool, said that no medical officer should be appointed without the highest credentials. He placed no confidence in diplomas. Dr. Strange said the new law did not define very clearly what were the duties of a county medical officer of health, and they must wait for the formation of district councils for this to be cleared up. Mr. J. W. Willis Bund, Sir H. W. Acland, Dr. Bond, Dr. Mitchell, and others joined in the discussion. Dr. Whitelegge, the medical officer of health for the West Riding, read a paper on the best means for carrying out the notification of the Infectious Diseases Act.

COMPETITIONS.

Lisbon.—We are informed that the Lisbon Law Courts scheme, for which a competition was recently held, has resulted in a fiasco; but, on the other hand, the report of the judges has not yet been published. It is now named that £20,000 is the sum to be spent in converting an old mansion into law-courts. This would be rather rough on competitors, among whom Mr. Moncrieff, of Bristol, it will be remembered, was one of the two successful architects. It is to be hoped that the Lisbon Post-office Competition will not have a similar ending. The plans went in last week.

The reopening of the Wesley Chapel, Charles-street, Cardiff, took place on Sunday, after restoration. The organ and orchestra have been removed to a gallery at the west end behind the pulpit, and the light from the large eastern window greatly enlivens the interior. A new pulpit with carved panels in Bath stone has been erected. The roof and the walls have been re-painted and decorated. The works have been carried out by Mr. Haines, builder, of Cardiff, and Messrs. Bell and Son, decorators, of Bristol, at a cost of £900. Mr. E. M. Bruce Vaughan, of Cardiff, was the architect.

The Midland Railway Company opened up on Tuesday through communication with Bourn, Lincolnshire, by the existing Lynn and Bourn joint line. The company will also shortly commence the construction of a piece of new line from Bourn to their system at Ashwell, the object being to obtain through communication between the Eastern Counties and the Midlands. This piece of new line, which is 18 miles in extent, will open up an entirely new district; its estimated cost is £360,000.

The session of the Royal Institute of British Architects will be opened on Monday evening, the 4th November, when Mr. Alfred Waterhouse, R.A., will deliver his presidential address.

New British Schools are about to be erected in the New-road, Chatham, from plans by Mr. G. E. Bond, of that town. They will be in three departments, and will accommodate 434 children, at an estimated cost of £1,800.

The parish church of St. Michael, at Woburn Sands, Beds, close to Woburn Abbey, was reopened on Saturday, after undergoing alterations costing several thousand pounds.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinion our correspondents. All communications should drawn up as briefly as possible, as there are m claimants upon the space allotted to correspondents.

It is particularly requested that all drawings and communications respecting illustrations or literary ma should be addressed to the EDITOR of the Build News, 332, Strand, W.C., and not to members of staff by name. Delay is not unfrequently other caused. All drawings and other communications sent at contributors' risks, and the Editor will undertake to pay for, or be liable for, unsought contri tions.

Cheques and Post-office Orders to be made payabl J. Passmore Edwards.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of United Kingdom; for Canada, Nova Scotia, and the Un States, £1 6s. 0d. (or 6dols. 30c. gold). To France Belgium, £1 6s. 0d. (or 33fr. 30c.) To India (viâ Brind £1 10s. 4d. To any of the Australian Colonies or N Zealand, to the Cape, the West Indies, or Natal, £1 6s.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advert ments, Public Companies, and all official advertiseme is 1s. per line of Eight words, the first line countin two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellane and Trade Advertisements (except Situation advert ments) is 6d. per line of eight words (the first counting as two), the minimum charge being 4s. 6d. 40 words. Special terms for series of more than insertions can be ascertained on application to the P lisher.

Front Page Advertisements 2s. per line, and Paragr Advertisements 1s. per line. No front page or paragr Advertisement inserted for less than 5s.

Situations.

The charge for advertisements for "Situations Vaca or "Situations Wanted" is One Shilling for Twen four Words, and Sixpence for every eight words af *All Situation Advertisements must be prepaid.*

Advertisements for the current week must reach office not later than 3 p.m. on Thursday. Front-p advertisements and alterations in serial advertisem must reach the office by Tuesday Morning to secure in tion.

NOTICE.

Bound volumes should be ordered early (price Tw Shillings each), as only a limited number are d up. A few bound volumes of Vols. XLI., XLVI., XL L., LI., LIII., and LVI., may still be had, p Twelve Shillings; all the other bound volumes are of print. Most of the back numbers of former volu are, however, to be had singly. Subscribers requi any back numbers to complete volume just ended sh order at once, as many of them soon run out of prin

Received.—A. J.—J. C. and Son.—B. of S.—E. L. D. D.—L. and Co.—B. J. and D.

Correspondence.

GRIMTHORPEISM IN THE NORTH

To the Editor of the Building News.

Sir,—It would have been better if "Wor "Individual" had shown a little less feeling a little more judgment when replying to letter of Sept. 20th; then perhaps he would have dealt in such an effusion as he treated to last week.

In the first place, I am very sorry he was disappointed in never having heard of the "son one" before. But why should he have been for I did not lay claim to long-matured kn ledge and skill, either as an architect archæologist.

In the second place, he attacks me (on my o admission of never being inside the church bef restoration—my misfortune, not my blame) claiming exact and accurate knowledge of *every* detail; but I never was so foolish as to cl any such thing. I saw the outside some t ago, and made a sketch of it, but could not inside. If he reads my letter again he will that the points connected with the *inside* I le an open question—such as the rebuilding of two westernmost arches and the *column* (print in error, columns in one place)—not being position to judge; but leaning walls, &c., h been straightened with rebuilding before n Further, I did not take the credit to mysel being magician enough to cause "split mulli and cracked headstones to reunite," nor di say that I could have given him "roofs wh would not have been poor and flimsy." Se he replied, he should have commented on w my letter set forth, and not to have wande away in accusing me of puffing.

As to the screen. Why should I "have lo and my soul delighted in, the old screen," if I am to judge of the original by what I of the "exact copy," it had no merit for

raise. All that is old is not in good taste nor beautiful. We often tolerate and preserve what is ancient, solely on the score of its antiquity, and would never dream of reproducing it. Your correspondent misses the drift of my remarks about the roof. What I meant to draw attention to was the very uncarpenter-like way of going about it in running cornice through and finishing plastering before fixing struts. The breaking out of new windows, I am informed, was adopted from the report of "an architect of very high standing."

Well, architects, of whatever status, may err, and the opinion of the one referred to would have had more weight if he had been known as an authority in ecclesiastical work. This question of windows I dare safely leave to the opinion of archæologists.

As to the two windows pulled out not *both* being of red sandstone, if I am in error in this particular my memory has deceived me, but it is a very trifling error, and hardly worth the mentioning. I am still of opinion that with judicious care and skill these windows could have been made to last as long as the church lasted, in spite of the cracked head and splintered mullion, the former remaining and the latter being replaced. As to the "trained eye" over-looking new work, and speaking of portions being *rebuilt* that had not been touched, I wish your correspondent had given me more details. I fail to see that it was incumbent on me to pick out and particularise every new stone, &c., and to "find as much fault as possible," nor that omission constitutes an element of inaccuracy. All that I stated as to rebuilding I gathered from someone on the works, so if there is any discrepancy, it is my informer's fault, not mine.

Last of all, your correspondent gathers all up into a grand burst of sarcasm, which is, I suppose, intended to crush me altogether. He says that I have stated the arcade arches to be elliptical (I should have said *semi*-elliptic) instead of being semi-circular. Even if wrong, what has this to do with my criticism of the new work? I couldn't measure the arches, and so only spoke from what struck me, and that was that they were not *true* semicircles, but inclined to the semi-elliptical; but if "Worthy Individual" will get some independent person to measure the width and the rise of those arches that *have not been rebuilt*, and to send the measurements to the Editor of this paper, and he is found to be correct, I will give in on this point.

Your correspondent complains that I have been finding as much fault as possible. He ought doubtless to be aware that all that is public is fairly open to criticism, and I don't think I have overstepped my right. Besides, nothing excites so much criticism as *so-called restorations*, and specially when they are carried out in such an irregular manner as this was, when the son of the builder (so I presume, according to the *North Star*) arrogates to himself the competency of carrying out the restoration of an ancient church, but instead transforms an exceedingly interesting church into just the reverse.—I am, &c.,

ARCHÆOLOGIST.

ST. ALBAN'S ABBEY.

SIR,—It was entirely *without* my permission, and *against* my wishes, that my name should have been brought into your columns either by Mr. W. H. Ellis or by Mr. H. Hems. As, however, much has been the case, permit me to state that the latter gentleman is quite mistaken in supposing that I "repudiated all knowledge of the former." What I *did* say was that, from his description, I could not identify him with any of my friends; but I now find I *did* know him, and some years since received kindnesses at his hands at Malta.

Trusting you will insert this small correction in justice to all parties, and that in future you will not permit personalities to enter into an architectural controversy,—I am, &c.,

GREVILLE JOHN CHESTER.

2, Russell-chambers, W.C., October 1.

SIR,—I regret that an opportunity has not presented itself before to enable me to reply to a certain portion of a letter relating to a sketch of part of St. Alban's Abbey, which letter appeared in your issue of the "B. N." for Sept. 20th, by your correspondents Messrs. W. Longmire and Co.

The writers there do not clear up a doubt which they have raised, as to who the actual perpetrators are. To my mind, a quibble has crept in here, in order to evade the answer. They ask, "Who was the destroyer here?" and do not attempt to say who was. It may possibly have been done before their advent. If such is the case, so much the better for Lord Grimthorpe and his adherents.

I have not the least desire to impute to anyone concerned in the restoration of the above-named abbey, any improper motives as to their disposition towards the work. I simply state what actually does, and what did, exist, and content myself thus far.

Lastly, Sir, I think it is a great pity that the good old work of St. Alban's should have to succumb to the new, instead of the new being subordinate to the old; especially when, as in this case, it has not gone beyond repair—knowing too, that it is the work of ingenious minds and skilled hands, affording us also one of the finest specimens of the development of Gothic architecture, whereupon to base our authority for everything that is genuine in design.—I am, &c.

GEORGE G. POSTON.

28, Southampton-street, Strand,
London, W.C., October 2nd.

SIR,—If Mr. Ellis—who is certainly an outsider as regards architecture and matters appertaining to the building trade—chooses, under cover of a *nom-de-plume*, to vilify the dead and the living, it is altogether his own affair. But it is quite impossible for me to accept an example of unfair fighting, and therefore I hasten to say that I have received a second letter from the Rev. G. C. Chester, in which he expresses his regret that when writing previously, he had quite overlooked the fact that he had met Mr. Ellis some years ago abroad, and had a pleasant remembrance of him.

Mr. Ellis was therefore quite within his province when he referred to the learned *savant* in question as his "friend."

As I now without any solicitation withdraw the charge made against him of presumptuously claiming the friendship of a scholar and gentleman, I trust he will, in return, have the common manliness to express regret that he should have gone out of his way, by implication, to cast reflections upon the character of one of the best of sons.

I am perfectly indifferent to what Mr. Ellis's personal opinions upon architecture in general, and on St. Alban's Abbey in particular may be.—I am, &c.,

Exeter. HARRY HEMS.

THE SLYPE AT ST. ALBAN'S.

SIR,—Messrs. Longmire omit to say in their letter to the BUILDING NEWS what they did to the slype. They should have added, "To show up the new five-light window we took down from the north side of the slype the arcading which was formerly there, and placed it under the new window (leaving the arcading in the opposite side in its old position). It is now some 8ft. or 10ft. from the ground. We also took down the old vault, and erected a boarded structure carried on wooden corbels; and, in addition, we erected an arrangement at either end consisting of fragments—Early, Middle, and Late."—I am, &c.,

ONE WHO REMEMBERS THE OLD SLYPE.

WASTE PIPES.

SIR,—"E. C. B." is quite right in asking questions on anything that may appear in "Practical Architecture," but why drag in a reference to jerry-building, when, as an old reader of the "B. N.," he must know that I have no connection with it except to try officially to prevent it.

Surely "E. C. B." knows that the old-fashioned trumpet-mouthed standing waste belongs to ancient history, and is not now allowed by the water companies.

A cistern fitted with a warning pipe, as required by the Water Act, is very easily cleaned by running off the water by means of one of the taps, and taking up the dirt, &c., with a cloth and pail.—I am, &c., HENRY LOVEGROVE.

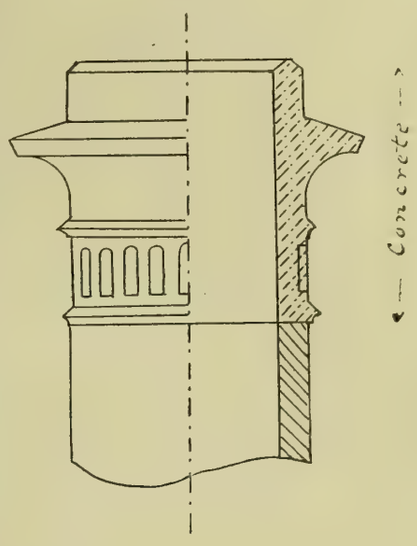
26, Budge-row, E.C.

TALL CHIMNEY-CAPS IN CONCRETE.

SIR,—Mr. Edmund M. Roach, architect, of the Octagon, Dunedin, New Zealand, has kindly favoured me with two sketches of tall chimney caps constructed in concrete. Perhaps the particulars may interest some readers of the BUILDING NEWS.

Fig. 1 shows the cap of a circular brick

Fig 1.



chimney-shaft, 100ft. high, built in 1875 for Messrs. Guthrie and Larnachs, Wood-ware Factory, Dunedin, architect Mr. D. Rose. The cap is of cement concrete, the sections of which were formed on the ground; these were secured together in position with cramps, set in cement. I am informed it is as sound to all appearance as when first built.

Fig. 2 shows the cap of a square brick chimney-shaft 100ft. high, built in 1884 for Messrs.

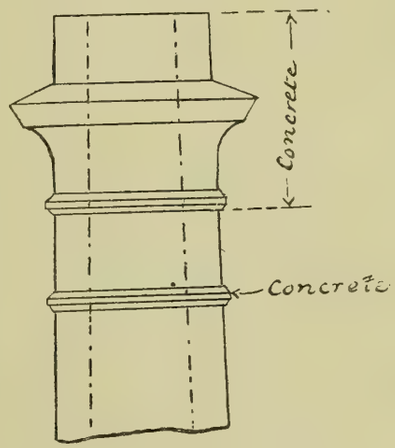


Fig 2.

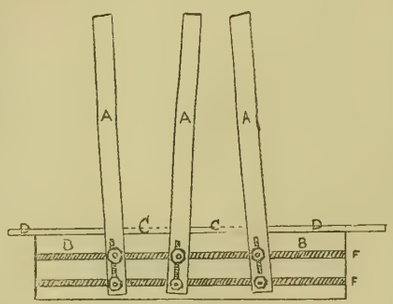
Bardsley and Son, Soap and Candle Factory, Great King-street, Dunedin, architect Mr. Edmund M. Roach. This cap was formed in position with cement concrete composed of 1 part best Portland cement, 4 parts clean blue-stone metal that passed through a 1in. ring, 2 parts clean blue-stone screenings. A mould was made, fastened together with screw-bolts, and when placed in position the concrete was hauled up in buckets, and carefully packed. When set, the mould was removed, and the whole at once covered with cement just thick enough to make a smooth face, but well worked in with a float.—I am, &c.,

Sept. 28. R. M. BANCROFT.

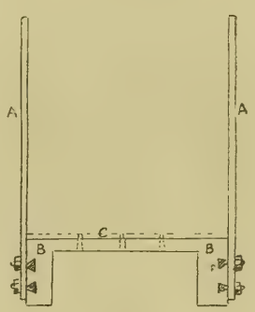
ARCH-BRICK CUTTING.

Sir,—The mode of cutting arch-bricks in most of the terracotta works is by a specially-made wooden box, and consequent upon the radii and pitch of camber heads and Gothic arches varying so much, these boxes soon get heaped up into a lot of patterns of little or no further utility, meaning a great deal of expense in time, labour, and material that may be economised.

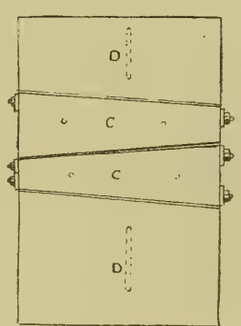
May I suggest this *one* arch-cutting box to suit all kinds of arch-bricks and camber heads?



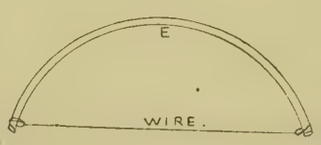
SIDE



END



PLAN.



A A A, wrought-iron upright guide bars; B, cast-iron frame, with F F, V-shaped slide grooves; C C, wooden templates (about ⅜in. thick) of face of brick required—these are fixed by ordinary screws from beneath; D D, wrought-iron adjusting plates, to carry off cross-ends; E, bow of iron gas-pipe to stretch cutting wire. The clod, or moulding, is made through a Bell machine, and sent between the guide bars A A A, which are adjusted to the required taper, and cut with the wire in the usual way.—I am, &c.,

Terracotta.

OUTSIDE LABOUR.

Sir,—When I wrote my plea to "Goth" *re* "Outside Labour," I did not bargain for the lengthy advertisement of himself written by "Quarry Owner." His array of unsolicited testimonials reminds one of the quack-medicine vendors. However, I do not intend to provide him with the opportunity of sounding his trumpet by carrying on a controversy with him. I am more than content to refer him to the paragraph from "Goth" in your last issue, every word of which, in my opinion, is incontestably true, as I suppose it will be entirely erroneous in the opinion of "Quarry Owner."

But as myself and "Quarry Owner" are both interested parties—I for the benefit of the employment to be derived from working stone at this end, and he for the profit of doing it at the other end—whilst "Goth" has no such personal interest, I think your readers will take it as worth while to attach due weight to the testimony of that gentleman against the practice of having their stone worked miles away from the building. We are told that "Quarry Owner" "always looks out the hardest and most durable stone for work intrusted to him." This is very conscientious and good of him; but, unfortunately, *all* other quarry owners have a habit of sending the hardest and most durable stone away in block, and retaining the softest and most easily worked to supply orders for prepared stonework, and it is rarely the case that the mouldings so worked contain as many members as the detail drawings. Whether the missing members are lost in transit, or if they are knocked out by the mould-maker by way of improving the appearance, I cannot say (large profits may have something to do with it); but I do know that it is worth while for architects who desire the detail of their mouldings to be carried out as designed by them to give an eye to quarry-worked stone on its arrival at its destination. I can bear out the fact of the vexatious delay that often occurs by this system, for I have known the heads of the upper windows delivered on a job whilst at a standstill for the sills of the basement windows. In all seriousness, I would advise "Quarry Owner," as he appears anxious to push the use of stone, to turn his attention to the energy displayed by his competitors in terracotta, who never allow an exhibition to take place without being represented there by some nicely-designed production. Let "Quarry Owner" take a lesson from them, and exhibit alongside of the clay imitation a creditable design in the genuine article—stone. He would thereby have the satisfaction of knowing that he was minding his legitimate business, and at the same time doing his best to increase the same. With many thanks for your courtesy,—I am, &c.,

Stonio the Stonecutter.

HARTLEPOOL HEADLAND PROTECTION WALL AND PROMENADE.

Sir,—I observe in your issue of last week, under the heading of "Building Intelligence," a short account of the opening of the Headland Protection Works and Promenade at Hartlepool by the Marquis of Londonderry on the 25th inst., in which, no doubt inadvertently, a slight discrepancy has been printed. It is there stated that Mr. Howkins was the engineer-in-chief, and Mr. Wm. Belk the resident engineer.

The facts are that Mr. Howkins, as consulting engineer to the Port and Harbour Commissioners, and I, as borough engineer of Hartlepool, submitted separate designs to the joint committee for the works on the 17th June, 1884. Mine was accepted, and was included in a Parliamentary Bill, and eventually carried out. I superintended the works until 1888, when I was appointed to this office. My successor, Mr. H. C. Crummack, A.M.Inst.C.E., previously of York, has since ably completed it. Mr. T. A. Matthews, of Bolton, was the contractor, Mr. Stead and Mr. Matthew Longstaff were the clerks of works, and Mr. Wm. Belk represented the Port and Harbour Commissioners.—I am, &c.,

H. Mair, Surveyor to the Vestry, and
formerly Borough Engineer, Hartlepool.
Vestry Hall, Hammersmith, W., Sept. 30.

Sir,—Your description of these works on p. 440, whilst being highly accurate, is in one respect incorrect: neither Mr. Howkins nor Mr. William Belk had anything whatever to do with the design or the execution thereof.

My predecessor, Mr. Hugh Mair, Assoc.M.Inst.C.E., then borough engineer of Hartlepool, was engineer-in-chief for these works from their inception until his appointment (in March, 1888) as surveyor to the Vestry of Hammersmith, and then the whole of the works, as well as important additions thereto designed by me, have been entirely under my charge. Perhaps you will kindly insert this letter in your next issue, and oblige—Yours, &c.,

H. C. Crummack, Assoc.M.Inst.C.E.,
Borough Engineer
Borough Engineer and Surveyor's Office,
Hartlepool, Sept. 30.

[A corrected account appears on p. 472, this v
—Ed. "B. N."]

CHIPS.

The chancel of the parish church of Brad[ford] Devon, which has been in disuse for nearly h[alf a] century, was reopened after restoration on Fri[day]. The special gifts have included a cross, vases, [a]r desk, and other articles of altar furniture in b[rass] complete; oaken altar-frame to carry the an[cient] altar-slab of slate; altar frontal needlew[ork] polished Plymouth marble for credence, sedilia, [and] altar step; and two-light window over sedilia. [Mr.] White, of London, was the architect, Mr. Hear[d of] Bradford, the contractor for masonry, and [Mr.] Short, of the same parish, carried out the w[ood]-work.

The city council of York have decided to offe[r the] the successor of Mr. E. G. Mawbey, who has [re]signed the office of city surveyor on his appointm[ent] as borough surveyor for Leicester, a salary of £[500] a year.

The parish church of Wrockwardine-w[ood], Salop, was reopened on Wednesday week a[fter] internal restoration, effected at a cost of £650. [The] works included the replacement of square h[igh] pews by open pitch-pine seats, the erection of n[ew] chancel arch, and the opening out of a fresh win[dow] in the chancel.

The partnership between C. T. and W. H. Mi[ller], of Bournemouth, architects and surveyors, has b[een] dissolved.

The new statue of Bishop Ken on the resto[red] great screen in Winchester Cathedral, was unvei[led] yesterday (Thursday) afternoon, when an addr[ess] on Dr. Ken's life was given by the Dean of Wel[ls].

The foundation stones of the new Liberal C[lub] were laid in Witton-street, Northwich, last we[ek]. Mr. Molyneux, of Northwich, is the builder, [and] Mr. M. K. Ellerton the architect.

The town council of Leeds have decided that [in] future no person other than the servants of t[he] Streets and Sewerage Committee shall be allow[ed] to connect house-drains with the sewers.

The statue of Bastien Lepage, by M. Rodin, w[as] unveiled on Sunday at Damvillers (Meuse), [the] birthplace of the painter.

St. Chad's Church, Shrewsbury, was reope[ned] yesterday (Thursday) after internal restorati[on]. The floor of the chancel has been raised 3ft. [in] height, and new altar-rails, credence-table, a[nd] litany-desk provided, and also new pulpit, wh[ich] stalls, reredos, and font are to be placed in positi[on] before Christmas. Mr. J. Yeomans, of the Mard[ol] Shrewsbury, was the contractor.

The modern church of St. Paul, Fulflood, ne[ar] Winchester, having been enlarged and restore[d] will be opened next week. It now consists [of] nave, transepts, and chancel, and a south porch a[nd] tower are all that remain unbuilt to complete t[he] scheme. Messrs. Colson and Son, of Winchest[er] were the architects, and Messrs. Carter t[he] builders.

The Exeter School Board have in course [of] erection at Newtown a boys' school, which, wh[en] completed, will accommodate 300. The plans ha[ve] been prepared by Messrs. Hayward, Son, and Ta[ylor] architects, High-street, Exeter, and the buildi[ng] has been entrusted to Messrs. Stephen and So[n] builders, Fore-street, Exeter. There will be [a] large room the whole length of the building, 80[ft.] long by 22ft. wide, and two classrooms formi[ng] wings and 25ft. by 18ft., all the rooms being 19[ft.] in height. The space between the two classroo[ms] is taken up with lavatories, cloak-rooms, and [the] master's private room. The walls are of bri[ck] with facings of Ham Hill stone. The cost is est[i]mated at £2,000.

The late Mr. T. W. George bequeathed to t[he] Corporation of Leeds his pictures, which compri[se] the following works:—Landscape with four figur[es] (Padgett), Cattle and Sheep (Watson, 1860), Land[s]cape and Stream (T. Holroyd), Landscape a[nd] Cattle (Sydney Percy), Shepherdess, Lamb, a[nd] Dog (Kinnaird), Landscape, Cattle and Brid[ge] (I. Taylor, 1883), Landscape and Cattle (T. Sydn[ey] Cooper), Deer (Ansell, R.A.), Lake Scene (J. [and] Shirley, 1853), Mountain Landscape, two (Padgett), Portrait of a Gentleman (Robinson), Landsca[pe] and Cattle (Griffiths), River and Boats. T[hese] works will be a welcome addition to the permane[nt] collection in the Fine Art Gallery of Leeds.

Intercommunication.

QUESTIONS.

[10103.]—**Dr. Angus Smith's Solution on l Pipes and other Ironwork.**—Should exal pipes treated with this solution be painted? and if ow is the paint made to adhere? I find that paint not key or hold to the smooth surface of the solution, slips, slides, and runs off (to use a painter's term cars").—M.

0104.]—**Noise from Billiard-Room.**—I am it to erect a billiard-room over the top floor of an ouse, running the floor-joists over the ceiling-joists a small space between them. I am anxious to prevent noise from disturbing the rooms below, and am id sound-boarding and saw dust will not be sufficient. any reader kindly advise me as to the best method to t in such a case?—Enquirer.

0105.]—**Helps on Sanitary Science.**—I shall leased if some readers will advise me, through the ium of your valuable paper, what steps to take to be equipped for a sanitary examination. I am a mason, ng fair knowledge of theory and practical building. I passed the Advanced stage in building construction class. What are the best books on sanitary science, their cost? Full information will oblige—An Intend-Candidate.

0106.]—**Builders' Premises.**—I was very inted some time ago in reading "A Builder's" idea of shops and their management, in your issue of the April last. The writer is evidently one who has had tical experience in all the intricate windings in conion with the management of a builder's business, and r one, should be very obliged if either "A Builder," me other of your numerous readers who are in a tion to do so, would pursue this subject further, stating best arrangement for a shop and yard, with all ssary adjuncts, stables, stores, &c., say on a plot of nd 2,500 yards in extent, for a trade employing about men, inside and out. A country builder like myself able to get into one grove of thought as regards the a business can be managed, and I feel sure that any rmation in continuation of the article I have referred ould be very much esteemed by country builders rally.—Jim.

0107.]—**Assistants in the Office of Works.**—someone kindly give me any information regarding t. Office of Works examination for Assistants, the ects in which one is examined, and the limit of age, ny further particulars?—J. C. T.

0108.—**Building Line.**—Referring to Section 3 of Public Health Act, 1888, can the local authority insist ew buildings being set back, so as to be in a line with ting buildings, no matter the depth such buildings been built back, and having regard to the fact that e are only two or three buildings on the same side of street, which is 800 yards long? I know of a case in h a set-back of nearly 100ft. is required so as to bring proposed building in a line with a house, when one of would suffice. The difference between 100ft. and represents a large money loss.—A Builder.

0109.]—**Brewhouse Floors.**—I am about to lay loors of a brewhouse with concrete arching on girders, should be very glad to know from anyone who has this kind of work how long the centres should be left re being struck? Also what they consider the best portion of materials to be used? Portland cement be used with broken bricks and gravel.—J. S.

REPLIES.

0075.] — **Plaster House, Audley End.**—It es me that your correspondent is mistaken in referto an interesting speciman of enriched plaster work ing at Audley End. Possibly he refers to the house ewport, known as "Nell Gwynne's House." It is le from the railway, on the left hand, coming from bridge, between Audley End and Newport stations, is a fine example of parge work. Date 1692.—C.G.

0086.]—**Liability of One Trade to Make od Damage to Another, where Work is ried out Conjointly.**—"H. L." states in reply y inquiry that "if the architect has a proper contract specification, he can adjust the differences between contractors." I am sorry the reply is so vague. It not convey to me the information required, nor will think, be of any utility to your other readers. As e is no doubt as to the plasterer's men having driven into the wall-bracket lead service pipes in fixing ds for running the plaster cornices, I am not only ng upon him to make good the plastering disturbed arching for the gas leakages, but purpose deducting his account (when I come to get out same) the ber's time, &c., in finding out defects and making piping. The specification has the usual clause "To e good after other trades," but is silent as to reparaof injury to other tradesmen's work. I think, how-, I am justified in the course marked out above; but uld prefer having the ideas of others, confirming or rwise my mode of proceeding.—Fairation.

0090.]—**School Closet.**—The very best thing you ave for your purpose is a latrine or trough closet of oulton, Adams, or Duckett type. I have had some rience with the latter, and can recommend them. can be regulated with the greatest simplicity to flush matically, any number of times a day with powerful ; they may be applied to any existing circumstances; are durable and cheap. If the circumstances of your would have permitted the use of "slop" or "waste r," then Duckett's system of "waste water-closets" advt. in current issue) would have given you great faction. I find that one of Her Majesty's Inspectors chools speaks very highly of the system, as carried out urfield School, Buxton. Amongst the many advans claimed for these closets, I think that the fact of own's water being saved, troublesome fittings and rns being dispensed with, and that they are not ted by frost, is sufficiently recommendatory to insure general adoption, where levels and other circumces are favourable.—S.E.

[10094.]—**Projecting Eaves.**—You can remove the gutter, or better, give notice to get it done by owner.—M.

[10094.]—**Projecting Eaves.**—"Lancashire" can, of course, at any time demand the removal of eaves gutter; but he had better not touch it himself, or he will be amenable for trespass.—R. Watson.

[10095.]—**Student's Lamp.**—I find that the common cheap kerosine lamp gives a soft and efficient light for work.—M.

[10096.]—**Measuring Modern Work.**—I am surprised at anyone wanting to measure modern work; but, nevertheless, "Northener" is free to do so as far as the rights of the architects are concerned. The architect sold the design to the person who employed him, and has no further right in it. Sir Charles Barry was of a different opinion, and in the erection of the Houses of Parliament there was a stringent rule that visitors were not to sketch. But his notion of property in designs and drawings was set on one side by the law officers of the Crown, and he was obliged to give up to them all his drawings as being bought and paid for. So much for the legal aspect of the thing. As to personal feeling, I should think that the architect ought to feel complimented, as "imitation is the surest flattery." If the owner of the house is not aggrieved, the architect need not be.—M.

[10096.]—**Measuring Modern Work.**—"Northerner" has done nothing dishonourable in measuring the works of a living architect for the purpose of study; but if he intends to use the design, that is quite another thing. There is much to be learnt from the work of a talented architect, whether he be living or dead.—H. L.

[10097.]—**Lear Board or Layer Board.**—I explained some weeks since that a lear board is the board at the side of a common gutter, the sloping board running up to the slates.—H. L.

[10097.]—**Lear (Lier) Board.**—The board on the rafters at the edges of V or trough-gutters.—R. Watson.

[10098.]—**Clerk of Works.**—"H. B. A." is rather young, and would do well to gain further experience on works either as foreman or assistant clerk of works.—H. L.

[10098.]—**Clerk of Works.**—If "H. B. A.'s" various attainments are really practical and thorough, and he knows how to set out, survey, and level, he ought to make an excellent clerk of works.—R. Watson.

[10099.]—**Hot-Water Supply.**—I always specify flow and return of the same size. I see no advantage in the method proposed by "Teachable."—H. L.

[10100.]—**Questionable Wood Flooring.**—Very few dwelling-houses have tongued floors in the London district—not five per cent. Tongued floors are not of much use unless they are 1¼in. thick, and a speculative builder uses 1in. or ⅞in.—H. L.

[10100.]—**Questionable Wood Flooring.**—Cheap villa residences have always such floors. What can you expect? They are made to sell. It is well if there's nothing worse to complain of!—M.

[10100.]—**Questionable Wood Flooring.**—Straight-joint flooring can hardly be called "jerry-work," although it might have been used for economy's sake, yet no harm is likely to arise from the causes mentioned.—R. Watson.

[10101.]—**Crumbling of Bath Stone.**—There are a number of so-called "preservatives"; but I am inclined to think oil-paint is most convenient and best. As to the appearance, most people would think it an improvement to an ordinary London house.—M.

[10102.]—**Architects' Charges.**—Two and a half or three per cent. would be fair; but I think I should charge in relation to the time occupied, without reference to the percentage rule.—M.

[10102.]—**Architects' Charges.**—"Mavis" might charge according to the time employed, as if the work is estimated at less than £1,000, a commission of 2½ per cent. would not pay. There is no ascertained amount upon which to base the commission.—H. L.

[10102.]—**Architects' Charges.**—"Mavis" should charge 1½ per cent. on his estimate, plus the charges for survey of premises and interview with district surveyor.—R. Watson.

The Bishop of Bangor consecrated the new church at Dwygyfylchi, Penmaenmawr, on Friday. The edifice, which is dedicated to St. Peter, occupies the site of the old church, having been reared upon its foundations. Mr. E. M. Bruce Vaughan, of Cardiff, was the architect, and Mr. Roberts the contractor. A series of stained glass memorial windows have been given by various donors. The east window represents the Crucifixion; the sanctuary windows portray the Resurrection and Ascension, and the west triplet window contains three subjects—viz., the Baptism of Our Lord, St. Peter Baptising the Gaoler, and St. Paul Baptising Lydia. The windows of the nave are filled with figures representing early British saints, four of which are on the north side, and two on the south. Messrs. Heaton, Butler, and Bayne, of London, were the artists.

Staverton Church, Devon, is to have its grand old wood screen, of 15th-century work, restored at the expense of an anonymous donor, who has placed £1,000 at the disposal of the vicar for the purpose. Mr. F. B. Bond, architect, of Bristol, will superintend the work of renovation, which Mr. H. Hems, of Exeter, has taken in hand. When the wood screen at Staverton is completed in 1890 it will be one of the most ornate in the county.

The new organ built by M. Ch. Anneesseus, of Grammont, Belgium, for Prestwich Church, was opened on Saturday.

LEGAL INTELLIGENCE.

Re S. J. C. Watson.—Mr. Registrar Linklater made on Saturday a receiving order under a petition presented against the debtor, now a convict in Pentonville prison, formerly residing at Herne-hill, and carrying on the business of a surveyor. The act of bankruptcy alleged was the non-compliance of the debtor with the requirements of a bankruptcy notice. The amount of the liabilities did not transpire.

Alleged Robbery of Bricks.—Henry Boreham, a brickmaker, Peter Wilson, Henry Moore, Samuel Bullingham, and John Redbourn, carmen, were charged at Dalston Police-court on Tuesday, with being concerned in stealing and receiving about 20,000 bricks, belonging to Peto Bros.; and Francis Rogers, an ironfounder, and William Head, a master carmen, were charged with receiving the same, well knowing them to have been stolen. The evidence as given by Detective-inspector Glass and Detective-sergeants Brockwell and Hearn, as also by James Jay, manager to Messrs. Cattermole, contractors, of Highbury, showed that Peto Bros. were carrying on the building of model dwellings at Brady-street, Bethnal-green; and Cattermole and Co. were employed to cart bricks from Allum's and Phœnix Wharves, Wapping, to Brady-street. It was alleged there was a conspiracy between the stackers, checkers, and carmen to pass the bricks out and take them to the premises of the receivers named. 2,800 bricks were found upon the premises of Rogers, and 4,900 at Head's place; and several thousands of bricks were found in the yard of a Mr. Austin, of Barrett's-grove, which were transferred from Rogers, as payment for money lent. Several statements were put in by the police as having been made by prisoners. Redbourn made a statement incriminating others, this being, in effect, that he took two loads of bricks to Head and sold them at 6s. a load; he received 12s. on the Sunday following the delivery; Moore also delivered bricks at the same place, and received money. Rogers, when the bricks were delivered, said, "You ought to let me have them less than half-price, considering the way in which they are got." Rogers received and counted the bricks, and paid 15s. a load for them. Rogers said he could do with 50,000 bricks, because he was going to build a factory. Mr. Austin was called, and deposed to receiving bricks at 30s. per 1,000, in payment of £15 12s. owing from Rogers to himself. Witness also purchased two loads from Moore, and gave him 30s. per load for them. After a lengthy hearing, Mr. Marsham said the evidence against Wilson and Bullingham was so slight that he should discharge them. All the other prisoners were committed for trial. Mr. Marsham agreed to accept two sureties in £100 each for Rogers, and two in £50 each for Head and Boreham.

CHIPS.

The ruins of the old church of St. Mary, at Bicton, Devon, are close by the new edifice which the late Lady Rolle erected at a cost of over £12,000 in 1851, and in its graveyard are the remains of a preaching-cross. A new cross, a fac-simile of the ancient one, is to be erected next month. It is a memorial to the late Rev. George Henry Kempe, who for more than 40 years was Rector of Bicton. It is being made at Mr. H. Hems's works at Exeter, and consists of an octagonal monolith shaft, surmounted by an ornamental cross standing some 14ft. high, and resting upon a triple array of octagonal steps. The whole is in grey Dartmoor granite.

The Pontefract Assembly-rooms, which have been closed for several months for decoration, were reopened on Saturday by a concert. The decorations have been carried out for the corporation by Messrs. Turner and Sons, of Wakefield, from designs by Mr. Bottomley, of Cross Hills, Keighley.

The prize of 100,000f. for the best work in the Paris Exhibition was awarded on Thursday by the Press Committee to the architect and constructors and workmen of the machine gallery. M. Duttert, the architect, will probably be allotted 20,000f., M. Condamin, the assistant architect, 15,000f., the five engineers 3,500f. each, and the workmen the remaining 47,500f.

Eleven years ago St. Andrew's Church, Sutcombe, Devon, was partially restored. Further works are now in progress, under the direction of Mr. R. Medley Fulford, of Exeter, including new oak roofs, which will be carved by Mr. H. Hems, of Exeter. In the chancel floor of Sutcombe parish church, and in the Shuborough aisle, are some of the finest old tiles in the county, the designs, in low relief, representing over 20 distinct patterns.

On Thursday in last week the town of Caerphilly was *en fête*, the occasion being the opening of the new market buildings erected by Mr. Alderman David Lewis, and of which Mr. Phillips, of Cardiff, was architect, and Mr. Rawson, of Cathays, the contractor.

Our Office Table.

The opening address of the session of the Society of Architects will be delivered by Mr. Robert Walker, A.M.Inst.C.E., President, on Tuesday, November 12. The other meetings for the coming session are arranged for Nov. 26, Dec. 10, Jan. 14 and 28, Feb. 11 and 25, March 11 and 25, April 15, May 13, and June 17. The meetings will in future be held at 7.30 p.m., instead of 7 as hitherto. A few of the later dates are still vacant; but anyone wishing to read papers thereat should submit them at once to the Council.

The sessional lectures to students of the Royal Academy will be opened on Monday evening next, when Professor John Marshall, F.R.S., delivers the first of a course of nine lectures on "Human Anatomy," the special subject being the Bones. The lectures will be continued on successive Friday and Monday evenings till the 4th prox. The Professor of Chemistry, Mr. Arthur H. Church, delivers the first of a course of six lectures on the grounds, oils, varnishes, media, and pigments used in painting, on Thursday evening, Nov. 14; and on Monday, January 6, Mr. J. E. Hodgson, R.A., will give the first of six lectures on the "History of Painting." Demonstrations in anatomy will be shown by Professor Marshall on five evenings in January, and Professor G. Aitchison, A.R.A., again selects as his topic "Roman Architecture." His lectures, six in number, will be given on Monday and Thursday evenings, Jan. 27 and 30, and Feb. 3, 6, 10, and 13.

The *A.A. Notes* for October mentions a rumour that Sir Arthur Blomfield, Messrs. Bodley and Garner, Somers Clarke and Micklethwaite, and J. L. Pearson are preparing designs for the new "Church House," but the information is incorrect; indeed, Mr. Pearson says: "I know nothing about it." From the same number we learn that the committee of the Association have given careful consideration to the request that an annual summer excursion should be established for younger members; but owing to the fact that the number set as a limit to the existing excursion (thirty) has not been reached during the last few years, they have thought it inadvisable to start a second excursion for juniors.

In connection with the Church Congress at Cardiff, which was opened on Tuesday, is an exhibition of ecclesiastical art. The loan exhibits include the pastoral staff just presented to the Bishop of Llandaff, a collection of 15th-century needlework lent by Col. E. S. Hill, M.P., rare and old books lent by the Rev. D. Lewis, and large and varied collections lent by Mr. J. H. Fitzhenry and the Rev. Greville J. Chester. The display of embroidery is unusually fine, the East Grinstead School heading the list. Among the trade exhibits, the display of art metalwork shown by Messrs. Hart, Peard, and Son, of stained glass and cartoons by Messrs. Heaton, Butler, and Bayne and Messrs. A. O. Hemmings and Co., and of metalwork, wood and stone carving, and embroidery shown by Messrs. Jones and Willis, are specially worthy of attention.

The question of water supply is one of such vital importance to all dwellers in cities that we are glad to notice the issue of a treatise on the subject from the pen of such a practical authority as Mr. James Macdonald, of Edinburgh. As might have been expected, Mr. Macdonald's work is full of useful facts, of which, perhaps, the most striking is that the daily consumption of water in Edinburgh equals 40½ gallons per head of the population. The great importance of this fact is apparent when it is remembered that this consumption is nearly double that of many cities in England and Scotland. While there may be exceptional reasons for some excess of water consumption in Edinburgh owing to the difference in the level in the mains and other local circumstances, yet there is good reason to believe that much of the excess which is noted by Mr. Macdonald might be reduced if adequate attention were given to the subject. At all events, the fact of one city consuming very nearly twice as much water as other cities of about the same size seems to be good ground for a thorough investigation of the whole question of water supply.

The organ at St. Barnabas' Church, Pimlico, has been very cleverly rearranged on the Casson system and revoiced by Mr. W. Thynne. It was originally built by Flight, and was the gift of Sir Gore Ouseley. Like many buildings of the date of this church, erected during the early days of the Ritual revival, it contains but a limited accommodation for the organ, and so a large instrument, such as this one, had to be crowded together in order to get it into the space available, much to the detriment of its musical effect. The new work just carried out has, by opening out the several divisions of the instrument, and by introducing Mr. Casson's plan for developing and controlling the pedal department, vastly improved the organ, and overcome the difficulties to which it was previously subjected. Each division now has its pedalier, and all couplers are stops of the division which they augment, e.g., swell to great, a stop of the great organ; choir to pedal, a stop of the choir pedalier. Separate combination actions govern each and all of the complete divisions, the stops in each division forming a separate group. The connections are tubular pneumatic, and are instantaneous in their action. This system of dividing out the organ greatly adds to the possibility of its development architecturally.

The annual statement as to the amount of business done in the Dean of Guild Court at Glasgow, made by Mr. Walls, the Lord Dean, on Friday, shows a gratifying increase in the works contemplated, which Mr. Walls attributed to the general improvement in business in that city. The total estimated value of the "linings" granted during the year was £685,520, as against a valuation of £390,320 in the previous years. The permits numbered 270 in all, of which 54 were for houses, 19 for churches and halls, 103 for warehouses and stores, and 94 for alterations and additions. The number of apartments in each class of house was—230 of one room, 905 of two rooms, 274 of three rooms, 83 of four rooms, 36 of five rooms, and 17 of six rooms.

A lecture on "House Decoration" was given at Edinburgh on Friday night by Mr. D. J. Vallance at the closing proceedings of the University Assembly, and proved one of the most popular addresses of the gathering. The lecturer dwelt first upon the instinct of decoration, and showed how primeval man had attempted to produce ornamentation. As to present-day decoration, he held that much of it arose from habit and imitation of custom. He went on to speak of the original application of decorative art, explaining the tendency of temporary decoration to become permanent. Having alluded to the system of reducing floral forms to geometrical subjection, he proceeded to show the chronological order of styles before and after the Christian era, and showed that the Greek and Roman styles, together with the examples of the Renaissance, formed the channel from which most of our house decorative art was obtained. A series of lantern views of architectural designs and artistic furniture specimens were exhibited. Mr. Vallance concluded by making a few remarks upon room decoration, pointing out that much more might be done than was done in improving the interior of workmen's houses.

The Technical and Trade Classes at the Polytechnic Y.M.C.I. have now commenced for the ensuing session. The introductory lecture to the plumbing students was given by Mr. J. W. Clarke on Monday last, under the presidency of Mr. John Smeaton, in the unavoidable absence of the late Master of the Plumbers' Company, who regretted that he could not attend. Amongst those present were several master plumbers who take an interest in the registration and technical education of plumbers. Mr. William Titmas addressed the students, and renewed his offer of special prizes to journeymen and apprentices for practical skill shown by them. Mr. W. Webb also addressed those present. The hall was crowded by plumbers, and at the close of the lecture large numbers took class tickets for the session, which bids fair to be very successful.

A small exhibition of amateur photography has been on view this week in Creed-lane, E.C., under the auspices of the Home Portraiture Competition for 1889, the judges being Messrs. J. R. Herbert, R.A.; A. M. Rossi, and H. P. Robinson. The gathering may be described as eminently creditable to the contributors, and the first prize, awarded to Mr. Alexander Keighley, was won by a series of well-chosen pictures of home and rural subjects artistically rendered. Mr. Alfred Stieglitz takes the second prize with some portraits and figure studies, and the thi prize was awarded to Mrs. Brian Hodgson, M A. R. Dresser coming fourth. Juvenile work were represented, showing how photography m be utilised by children. There were upwards 100 contributors, and over 1,000 photograp were exhibited; some of them, however, we small and unimportant. The promoters of t exhibition were the proprietors of the *Amate Photographer Journal*.

A course of twelve lectures for sanita officers, specially adapted to candidates pr paring for the Sanitary Institutes' Examinati for sanitary inspectors, is to be given at t Parkes Museum on Tuesday and Friday eve ings. These lectures are a continuation of t courses previously delivered in the Park Museum, and it is proposed to repeat the cou twice each year, to suit the requirements persons preparing for the examinations of t Sanitary Institute. A fee of six shillings will charged for the course. The first of the cour will be given on Tuesday evening next by "t father of sanitation," Sir Edwin Chadwick, wl has selected as his subject the "General Histo of Hygiene," and the succeeding lectures will delivered by Dr. Louis Parkes, Professor I Robinson, Sir Douglas Galton, Professor Co field, and Messrs. H. Percy Boulnois, C. J Cassal, Shirley F. Murphy, J. F. J. Sykes, ar A. Wynter Blyth.

WATER SUPPLY AND SANITAR MATTERS.

Preston Water Supply.—The borough engine of Preston (Mr. H. Reah, C.E.) has prepared an el borate report on the present water supply, with r commendations for increasing the same. There is on one iron main (placed in "bad, wet, treachero ground") to supply the town, and so disastro would be the stoppage of mills were it to burst th an additional iron main from the reservoirs to t town is recommended, along with the substitutio for about a quarter of a mile (in place of the existi 20in. main from Acregate-lane up to the o borough boundary) of a new 24in. iron main. T estimated capacities of the reservoirs from whi Preston is supplied are: Spade Mill, 100,000,00 Alston, 84,217,354; and Grimsargh, 59,173,00 total, 253,390,354 gallons. An additional reservo at Alston, to hold at least 120,000,000 gallons, recommended. The top-water level of this rese voir would be about 15ft. or 16ft. higher than t top-water level of the present reservoir at Alsto The rough estimate of the cost of works set forth this report is about £60,000. The average dai consumption of water in Preston is about 3,000,0 gallons.

MEETINGS FOR THE ENSUING WEE

Monday.—Society of Engineers. "Pin-connected Riveted Bridges," by J. H. Cunningha Westminster Town Hall. 7.30 p.m.
Clerks of Works' Association. Month Meeting, Carpenters' Hall, London-wa 8 p.m.
Liverpool Architectural Society. Op ing Address by the President, T. Mella Reade.

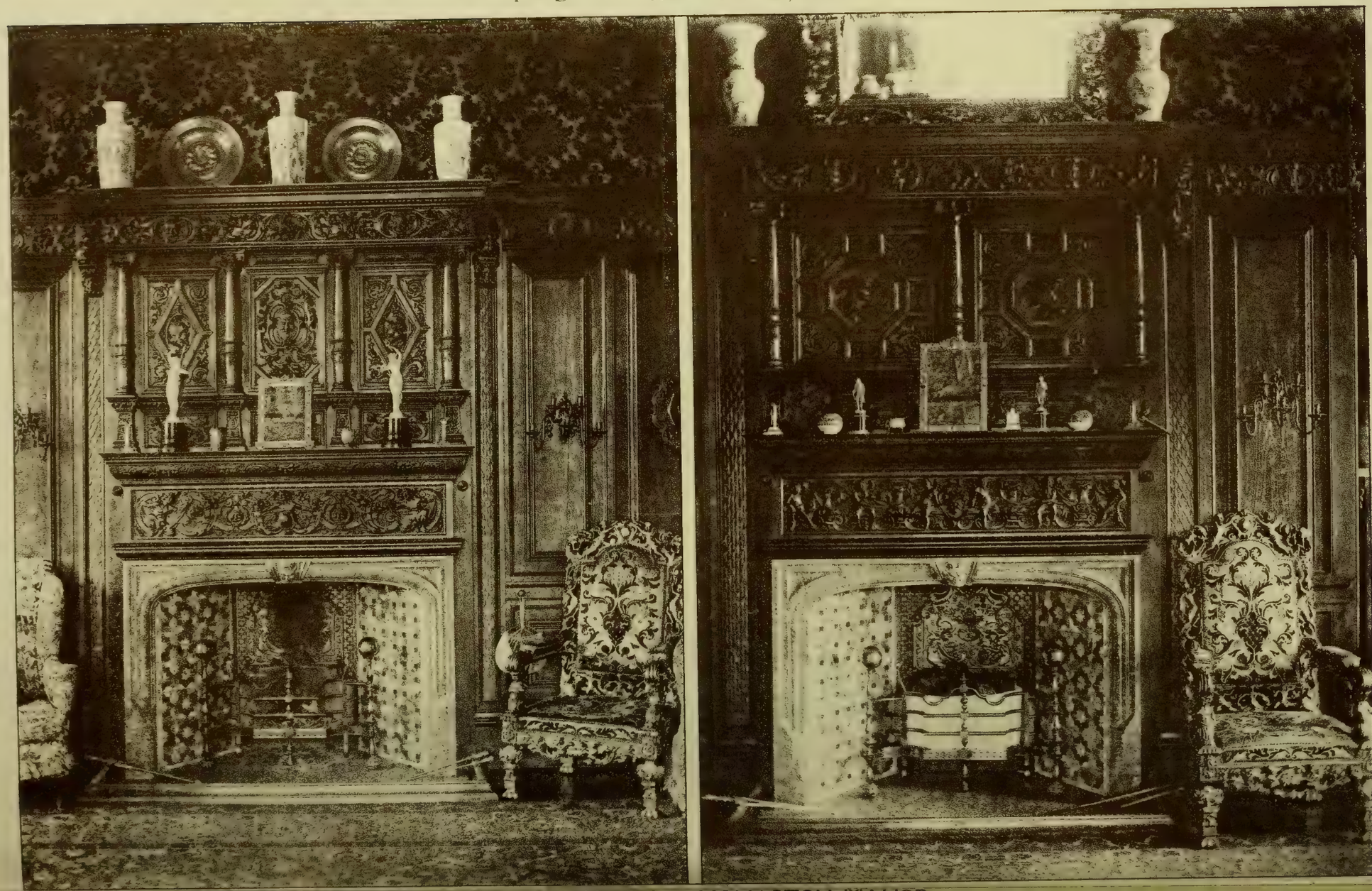
Tuesday.—Sanitary Institute, "General History, Pri ciples and Methods of Hygiene," by S Edwin Chadwick, K.C.B. Parkes Museu 8 p.m.

Friday.—Sanitary Institute, "Water Supply, Drinki Water, Pollution of Water," by D Louis Parkes. 8 p.m.

BUILDERS' CLERKS' BENEVOLEN INSTITUTION.
Notice is hereby given that the ELECTION of a PENSIONER shortly take place. Forms of application may be obtained of Secretary, H. J. WHEATLEY, 21, New Bridge street, E.C.

Holloway's Pills are the surest preventives of many maladies engendered by warm weather, profuse perspirat free living, and other excesses. They throw out all impurities fr the system, rouse the torpid liver, and stimulate the sluggish kidne whereby the weary invalid recovers both strength of body and e ticity of mind.

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CHIMNEY-PIECES AT OSMASTON MANOR

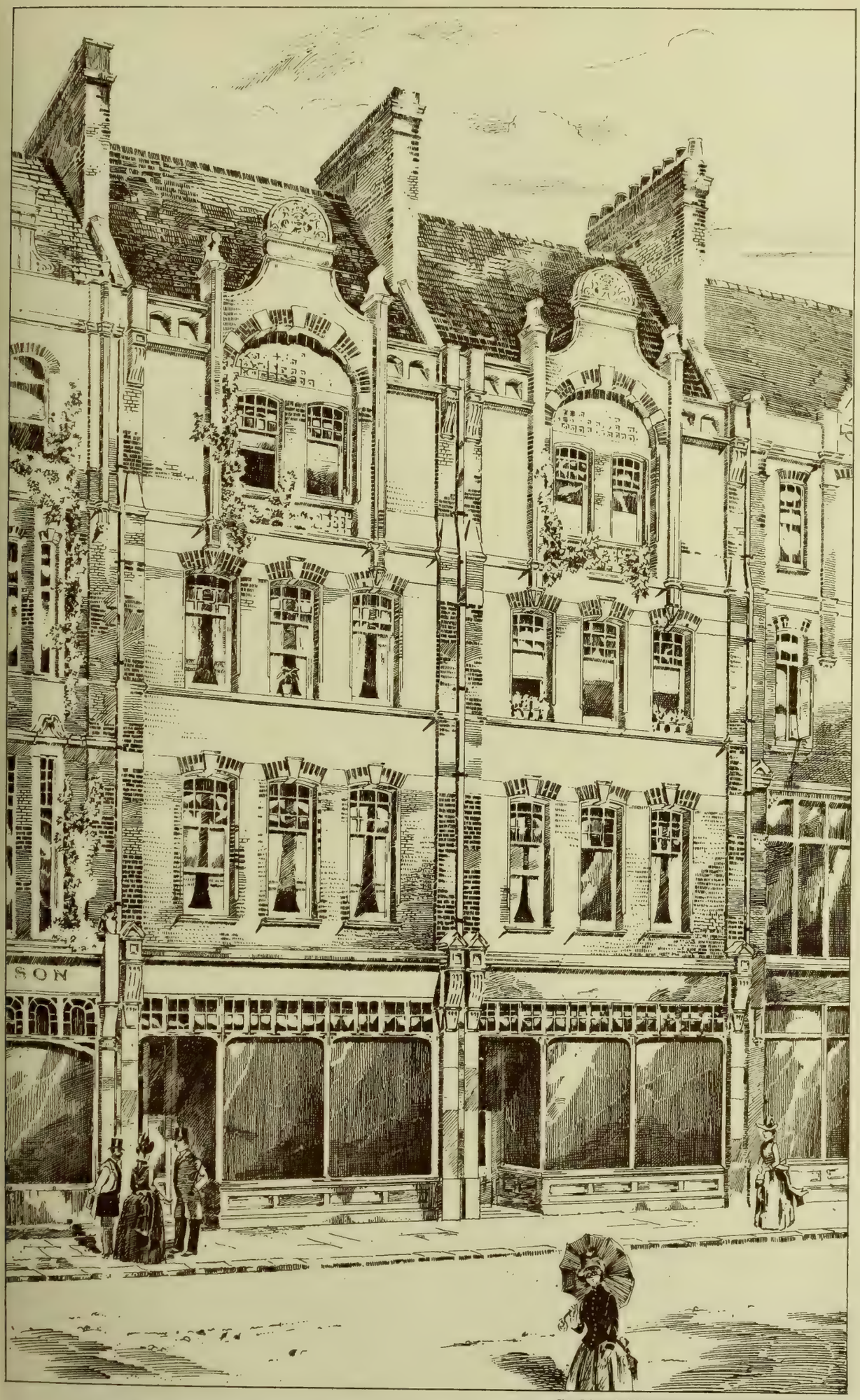
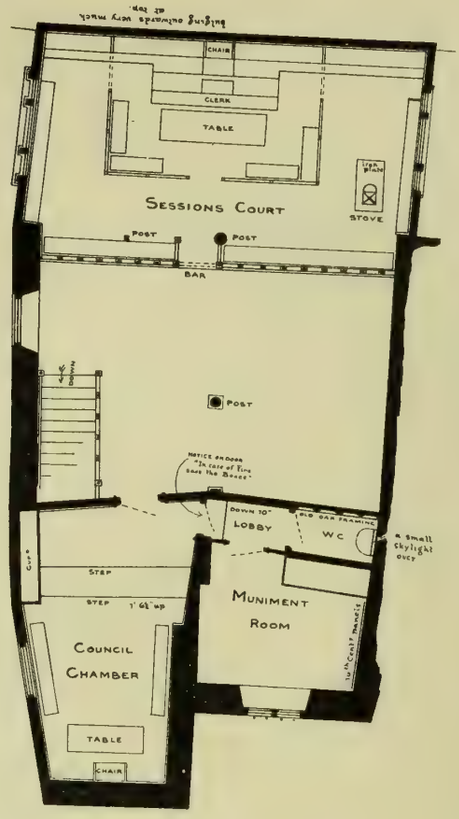
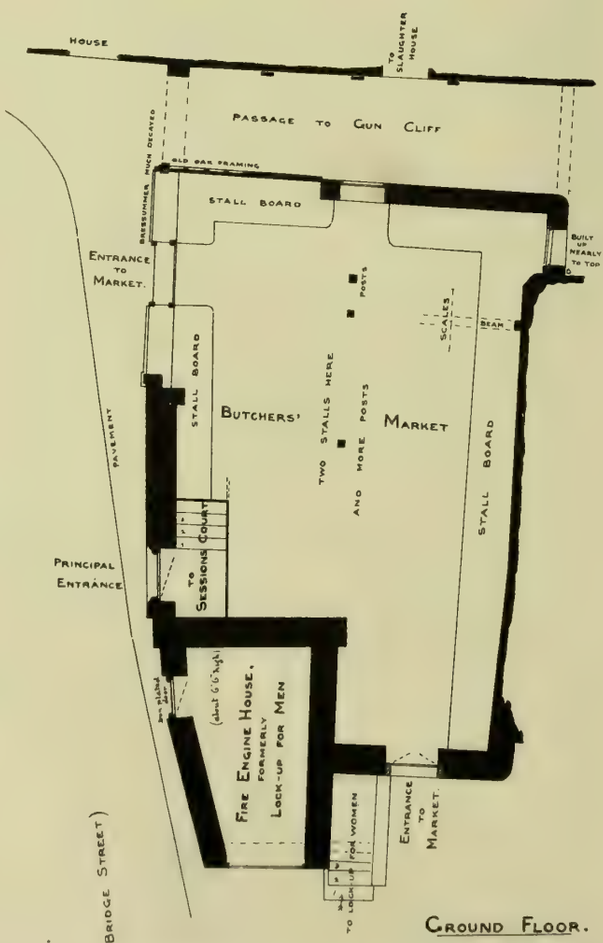


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W C

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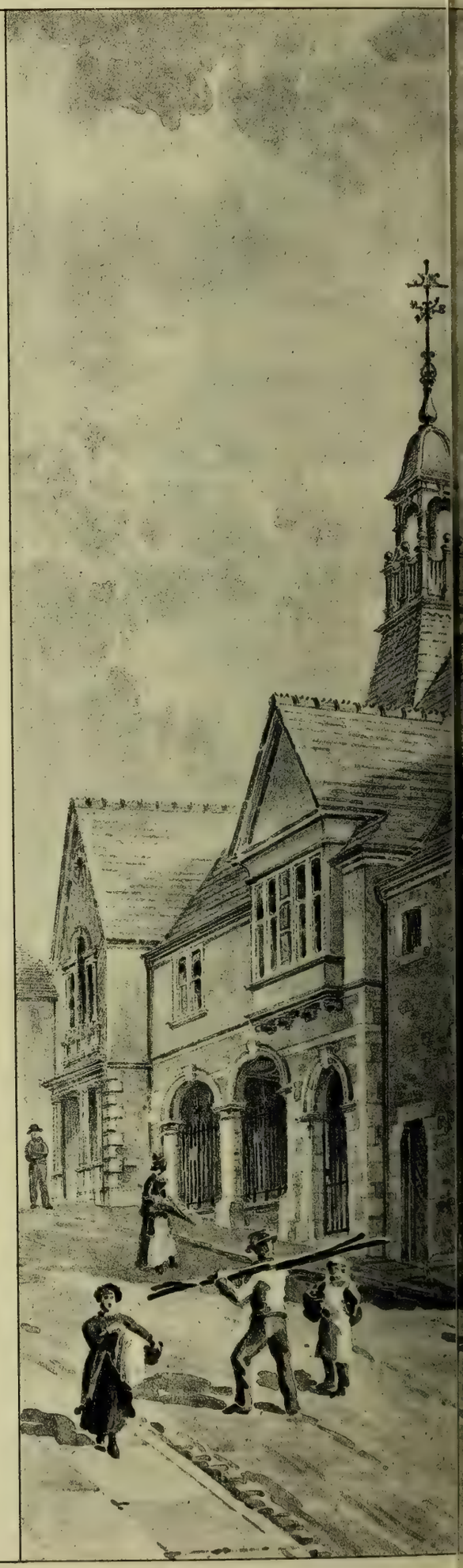


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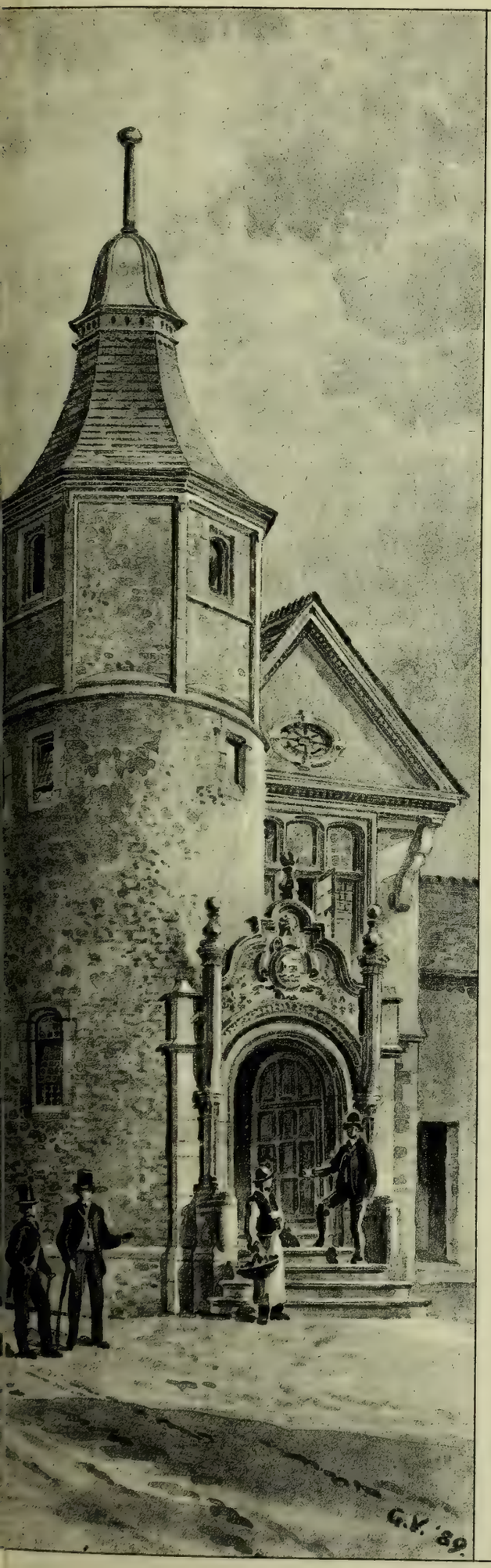


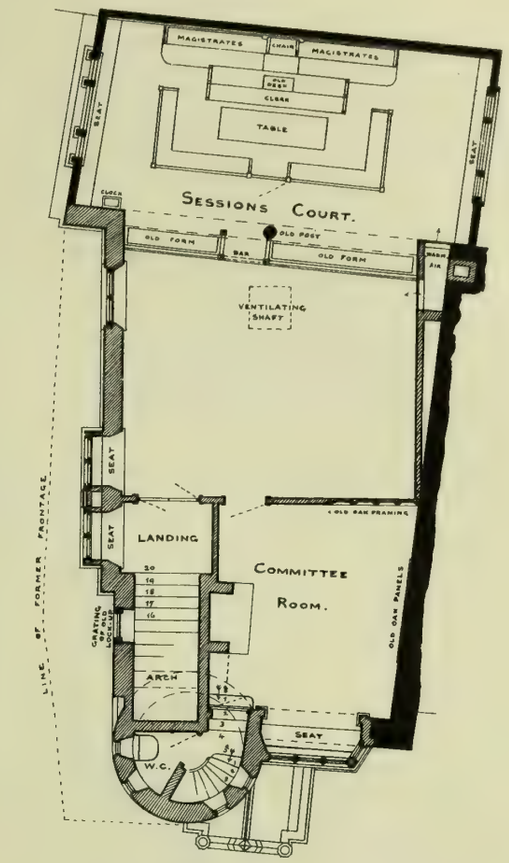
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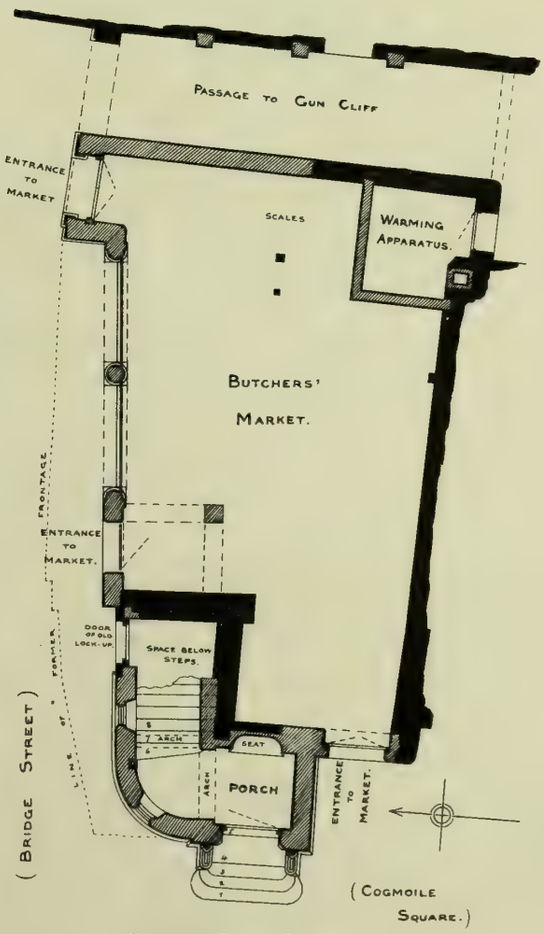


TOWN HALL - LYME





FIRST FLOOR PLAN.



GROUND FLOOR PLAN.

"PHOTO-TINT," by James Akerman 6 Queen Square London W.C.



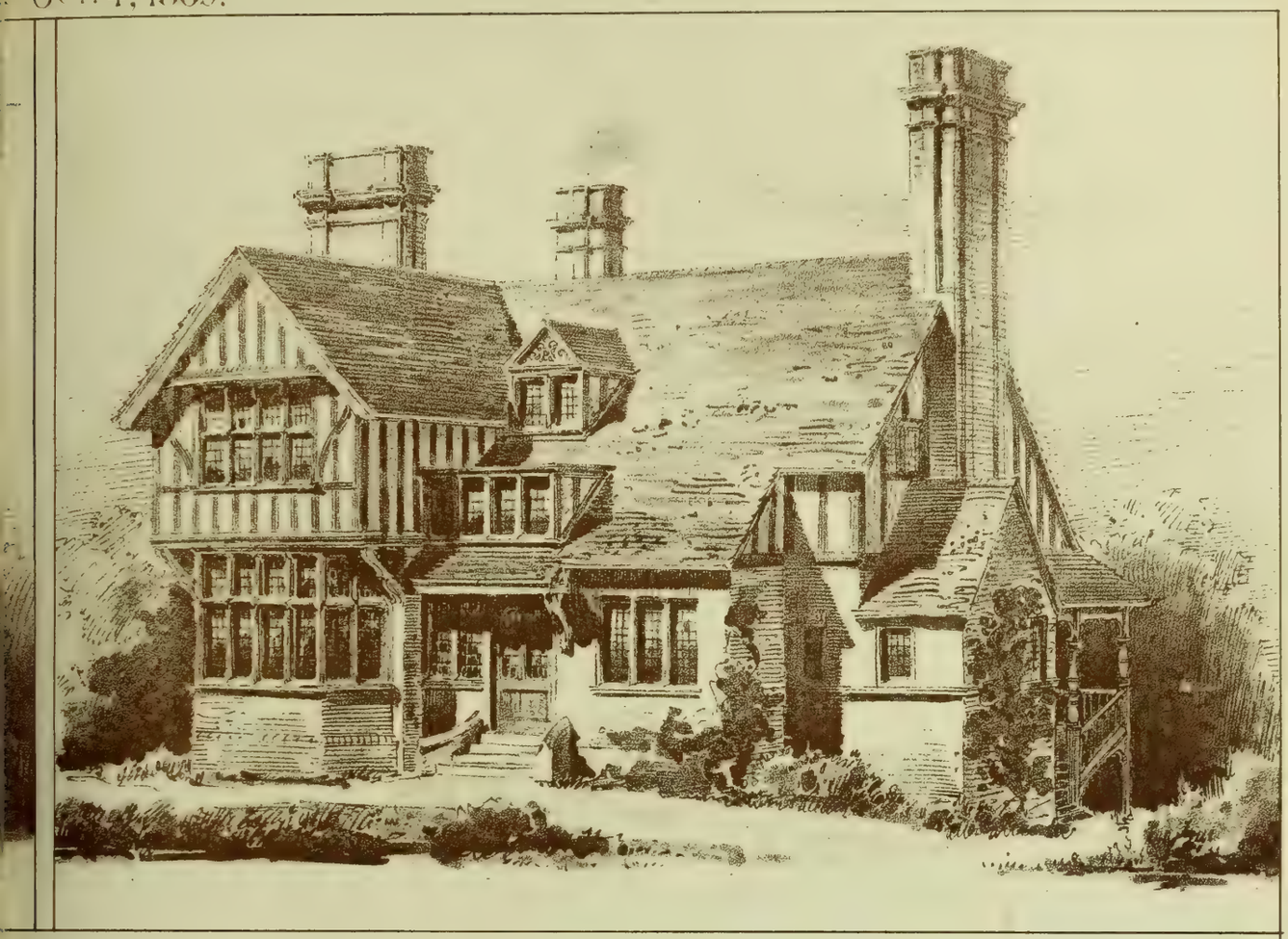
FIRST FLOOR PLAN



GROUND FLOOR PLAN



BUNGALOWS



A Sheet of Bungalows



"Photo-Tint," by James Akerman, 6 Queen Square, London, W.C.

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1814.

FRIDAY, OCTOBER 11, 1889.

REPORT OF THE SELECT COMMITTEE ON WOODS AND FORESTS.

IN the early part of the present year a Select Committee of nineteen members was appointed to inquire into the administration of the Department of Woods and Forests and Land Revenues of the Crown. The report just issued is simply a collection of evidence of numerous witnesses, and the committee state they cannot conclude their investigation in the present session. They merely report the evidence taken, and recommend that a committee on the same subject be appointed in the next session of Parliament. The subject is of general public interest, and we shall, therefore, give a brief *résumé* of the thick Blue-book, referring first to the examination of the two Commissioners, and then to the evidence submitted by the surveyors and other professional officers. The names of those appointed include Sir Joseph Bailey, Sir Michael Hicks-Beach, Sir Henry Fletcher, Sir W. V. Harcourt, and Messrs. Arthur Acland, W. G. C. Bentinck, Stormonth Darling, Henry H. Fowler, Donald Crawford, Charles Hall, Heneage, Hobhouse, H. A. Isaacs, Jackson, Pinkerton, Samuelson, Shaw Stewart, Tuite, and Arthur Williams. The evidence given in the bulky Blue-book, and which represents the proceedings of several meetings under the presidency of Mr. Henry H. Fowler, is of a mixed and hetereogeneous nature, and to summarise and draw conclusions at this stage would be undesirable. The statistical details are of interest, however. We have, first, the evidence given of the two Commissioners of the Woods and Forests, Mr. George Culley and Colonel Nigel Kingscote, now Sir Robert Nigel Fitzhardinge Kingscote, each of whom has a separate department to look after. Admitting the qualifications and experience of these two Crown Commissioners, we are surprised that only two should be appointed. Originally, when the offices of Woods and Works were united, there were three Commissioners, a chief and two others, but since 1851 there have been only two. Cases of disagreement are likely occasionally to arise between them, and then the advantage of a third party is obvious. We learn from the evidence that the staff under these gentlemen is also divided, though there is some part of it which is common to both, as the Receiver-General, the bookkeeper, and registrar. Each of the Commissioners receives £1,200. The principal and junior clerks, who number about twenty-four, receive various salaries, from £900 to £80, and the salaries of Commissioners' clerks and office staff, exclusive of receivers and surveyors, amounted during 1888 to £16,709. Excluding legal expenses, these latter offices amounted to nearly £10,000, and the total expenditure during the same year, including incidental expenses, plans, legal matters, repairs, forests and woodlands, &c., was £107,631. These expenses include the staffs of officials, receivers, and clerks under them for Ireland and Scotland. Mr. Culley has the control and supervision of all the woods, forests, and mines, as well as the land revenues in Wales, Scotland, Ireland, the islands of Man and Alderney. Colonel Kingscote has charge of the land revenues in England, including Windsor Parks and Woods, Chopwell Woods, Sulcey and Hazleborough Woods, and Delamere Woods.

Little idea can be formed of the greatness of the territory in the charge of the Commissioners. Take, for example, Mr. Culley's charge in England. It includes the Dean Forest, the acreage of which is 18,710 of forest, and of woods 15,664, the Crown being owner of the soil subject to certain common rights. The income is derived from the sales of wood mainly, also from the minerals, coal and iron, 12,000 acres roughly. The High Meadow Wood or Estate, Gloucestershire, adjoins Dean Forest, and comprises 3,580 acres, over 3,000 acres being inclosed and planted. It belongs to the Crown in fee simple. The New Forest comes next, including over 64,834 acres, of which over 23,000 acres are woodland, the remaining 40,000 acres being waste land grazed upon by cattle, heath and bogs largely. Next there are "Alice Holt Woods," Hampshire, of 2,077 acres, nearly all covered by wood, also Bere Woods in the same county of 1,450 acres, nearly all woodland; Parkhurst Woods, in the Isle of Wight, of 1,250 acres, largely planted. Mr. Culley also receives small fee-farm rents in some 38 English counties, the whole sum of these being £1,250, the average rent amounting to a few shillings. In Wales the Crown properties consist chiefly of fee-farm rents, and small manorial rents, these include shooting rents. Minerals are found under 330,000 acres in Wales, and belong to the Crown. The profits on mines are large. In Ireland the property consists of unimprovable rents, proceeding out of property granted by the Crown to the predecessors of the present holders subject to quit rents. The income last year was £37,176. In Scotland the bulk of the Crown property is in Caithness, over 8,000 acres, 6,000 of which are moor; the "feu" duties, amounting last year to £11,813, these being similar to tithes. These constitute the main properties. To turn to the financial part of the evidence, we find that the income arising out of the 18,000 acres of land in the Forest of Dean during the last year is £6,200, from coal rents and royalties £12,954, from iron £1,374, from stone £524, and other sundries.

The staff employed to manage the forests and woods are a deputy surveyor, who receives a total for salary and emoluments, £868; an assistant deputy surveyor, whose salary is £150, and who gets allowance for house £60, other allowances £193; the latter item being curiously made up of "horses," for acting as agent for looking after the railway lines, which sums are repaid by the company, thus reducing the sum paid to the deputy assistant surveyor to £348. To say the least, this is a curious arrangement. Why give an allowance for house of £60? Well may the chairman have asked whether a house given him is worth £60 or that amount allowed him for one. Why also should the salary for railway inspection be put down in this account? The evidence elicited respecting the income derived from the Forest of Dean High Meadows of £9,576 shows that the staff employed to collect this income consists of an officer who gets £868 a year, of which the railway company pays him £54, and a second officer, who gets £403 a year, who also receives £54 from the company. Other officers are employed: a wood foreman and keepers, who receive small salaries. We also learn from Mr. Culley's evidence that the timber was originally grown for the Navy; but this is long exploded, and the produce is sold in the open market for what it will fetch. The timber grown in Dean Forest is nearly all oak; that in High Meadow oak and larch. Sales are by auction and private bargain. The highest tenderer is accepted. Sir J. Campbell's evidence on this point is of interest. He says sale by auction is generally given up. Tenders are asked for before the fall of the timber, which is to be cut down at the purchaser's expense. The standing timber is measured and then advertised for, as so many oak trees in such a place. As a rule, the Crown men are employed to cut down and the purchaser pays them. This is an arrangement that may be open to question as a matter of business. Would it not be more business-like for the purchaser's own men to cut down, the Crown men retaining their independent position as guardians of the forest. We can imagine such a thing as a buyer paying liberally the men to cut down a few additional trees, and no one being any the wiser. The practice lends itself to undesirable transactions between buyer and man.

The chairman, in his examination of Mr. Culley, expressed some doubt about the wisdom of paying 26 per cent. for realising the income from the surface of the Forest of Dean. Adding the sums expended for those Crown properties, we find the expenditure is £6,493 to obtain £9,500. The cost includes the preparation of the article for the market, and, in fact, the Crown practically carries on the business of the "manufacture and growing of timber." Mr. Culley thinks the business may be an undesirable one for the public to carry on, though it would be a pity to part with the Forest to other speculators. High Meadow, which adjoins the Forest, is bounded partly by the Wye, and its situation and beauty near the ruins of Tintern are well known. It was bought to supply the Navy, like Dean Forest, about the beginning of the present century. The fee-farm rents are worth 25 years' purchase, and the Commissioners agree that it is desirable to get rid of charges arising out of other peoples' property, even by reducing this price. The collection of the rents makes a heavy item. According to Mr. Culley about 30 per cent. of the value of the produce of the Forest is consumed in cutting the trees, lopping, tying up bavins and faggots, and preparing for market. Years ago, according to the figures given, the Forest earned more. In 1854, when there was a general slaughter of old trees, the income was £14,000, in 1856 it was £24,000, nearly half of which went for expenditure. The matured timber was all sold to the Navy; now there is none left. This slaughter of timber went on from 1854 to 1864, and then the replanting had to be commenced, so that no great income can be expected till there is another cutting of matured timber.

The income and expenditure of the New Forest are also given as follows:—Total income was £10,777, chiefly derived from the sale of timber. The deputy surveyor gets altogether £920, £670 of which is fairly chargeable against the New Forest; the first assistant receives £210, the second assistant £150, clerk of deputy surveyor £120. Including the foresters, the total expenditure for looking after the forest is £2,212. For general management the total is £8,893 odd. In this great forest also the slaughter of trees in 1856 for Navy purposes was immense, the consequence of which is there is no full-grown timber to sell except the William III. plantations, about 370 acres, planted in 1700. Now the sale crops are the thinnings of plantations made before and since the Deer Removal Act, 1853. The area of the New Forest is 65,000 acres, over which the Crown has forestal rights; but the perambulation area is about 93,000 acres. There are 27,000 acres of private lands that run into it or are inclosed by it. One important fact is elicited by Sir William Harcourt, who refers to the Act of 1877, which greatly restrained the Crown's power. Before that date the Crown possessed a "rolling" power; as fast as they threw out an old inclosure they were entitled to take as much out of the forest as they had thrown out. In consideration of removing the deer the Crown was to have a further power of inclosing 10,000 acres. The Act of 1867 prohibited them from inclosing any more, and it further provided that in cutting trees for sale, care should be taken to maintain the picturesque character of the forest by leaving a sufficient number of ornamental trees. The

Crown has power over 17,670 acres for cutting and planting. The evidence of the Hon. Gerald W. Lascelles, deputy surveyor of the New Forest, who is charged with the general supervision of the plantation and property, is of interest. That gentleman receives all the rents, and submits monthly accounts to the Commissioners. Out of the 92,000 acres perambulation the great manors of Beaulieu, Brockenhurst, Minstead, &c., are taken. Many facts respecting the timber and the planting are given. We learn that the staple timber is beech. The great plantations of 1700 and 1775 are given. An important point of this evidence refers to the question of letting freehold land at Lyndhurst for building purposes; also to the application made to the Commissioners to grant land for a sewerage outfall for Lyndhurst; but the scheme has fallen through because the Lyndhurst people wanted a better tenure than the Commissioners offered, that is a license to use a piece of ground as an outfall during pleasure. The Local Government Board reported on the desirability of sewerage works, and Mr. Lascelles himself thinks that the Commissioners should have power to grant a piece of land for sanitary works. The want of a water supply for Lyndhurst has stood in the way of improvement. We are glad to hear that the ruling principle in the management of this forest is to preserve it for its ornamental beauty as a public ground.

The evidence of Mr. Ralph Clutton and Mr. John Henry Clutton is of special interest from a professional point of view, the former attending to the building land and London property, the other to the agricultural land drainage. In explaining that a sum of £3,000 a year is expended for clerks—a very large sum certainly over a property of 57,000 acres with a rent-roll of £80,000 a year—Mr. J. H. Clutton says seven clerks are entirely occupied in Crown work. Some of these prepare designs for buildings, others prepare estimates for repairs, draw up reports, and interview tenants; the farms are numerous, and many of them are of about 600 acres. The designs and repairs of farm buildings make a large proportion of the work. There are certain advantages in employing a staff for this particular work over engaging outside architects, as the staff know the localities and class of work better; on the other hand, the public are not always satisfied. The average profit to the firm of the last three years is stated to be something under £1,000 a-year. Sir Michael Hicks-Beach's examination shows briefly that all plans of cottages and other buildings are made at Messrs. Clutton's offices; that the work is mainly done by contract, except repairs, which are intrusted to a builder, who gives an estimate for the work; the work of the builder is checked by the architect of the firm, and that this rule is generally followed. In reply to a question whether the firm is contented with the check on the builder in large or small works, the reply is "Yes, except when a clerk of works is employed." Public tendering is not resorted to. In further examination, it is stated, a detailed specification and estimate are made, and then an estimate from a builder is obtained, arranging with him the price at which the work is to be done; and all the work and repairs are done in this way. Mr. Heneage's questions were equally close and searching as to the mode the work is carried out. We learn from them that the builder gives an estimate, and that if the surveyor sent out from the office passes the work, the builder is paid. Asked whether it would not be more satisfactory to pay the builder by a scale (schedule), and have the work measured by a competent surveyor, the reply is, that there is not a great deal of that sort of work. Fresh plans are prepared for every cottage or pair of cottages that are built, and that, although many cottages are almost identical, a plan is prepared to sign before the contract is drawn for every case. Each builder takes out his own quantities from a specification which is supplied. The questions and answers here are tiring. Mr. Heneage sought to elicit the fact, not disputed, that when a cottage is wanted for any locality, the surveyor had merely to copy or trace some other plans that would suit the purpose. On the question of drainage the evidence shows that this part of the work is intrusted to an engineer, Mr. Grantham, who is paid by Messrs. Clutton, they taking all responsibility. It would far exceed the limits of our article to give the evidence bearing on other professional matters, such as those relating to the office of architect and surveyor of the Crown estates in London, held by Mr. Arthur Cates, whose evidence is of value and interest, and to that part of the evidence we shall return.

BASIS OF TENDERING.

IN the acceptance of tenders, considerable caution is desirable. As is often the case, the lowest tender is accepted, and this rule is certainly the only just course to follow when the tendering parties are all respectable and responsible tradesmen, and have fairly and equally been instructed in the work to be performed. We have often heard of an undercutting individual coming in and inquiring if such a provision of the specification will be rigidly enforced, and endeavouring to find out in a tactical sort of way, if the architect really intends to enforce the conditions of contract—if he will not agree to another material or maker if the article is good; and sometimes he obtains an answer from a clerk, perhaps, that if the material or workmanship mentioned is fairly good, he will be allowed to use it. Thereupon the eager and dodging party sends his tender, which is quite 20 or 30 per cent. below any of his brother tenderers who have obtained no such private information or concession, but who have honestly taken the specification and bill of quantities as they are, and have priced accordingly. This sort of "back-door" information is a cunning device of the tenderer in country towns. Who can wonder at the marvellous disparity between the tenders? A., B., and C. have taken the information from the plans and specification, have interpreted the words therein used in their literal meaning; but D. has very liberally discounted their actual intention, or has by some hook-and-crook means obtained information that the others have not had. In one instance we know one of the tenderers was a builder who had been employed to pull down the old house, to make way for the new building; he was thereby in possession of facts which the competitors for the new building knew nothing about; the actual quantity of old material that could be re-used he knew, and when the tenders came in his amount was quite 40 per cent. below any of the others, and was accepted. The result was evidently unfair to the men who had taken their own quantities from the plans and specification, and was a strong reason why, in a matter of rebuilding in which the old materials were to be re-used as far as they were fit, quantities should have been supplied. The tendering ought to have been confined entirely to a fresh set of builders, the contractor for pulling down the old premises being excluded. Many builders make it a point not to give a tender under such circumstances, nor can we blame them. In a case before the council at Salford a tender for the sum of £3,550 was proposed to be accepted for excavation and brickwork at the gasworks; but an amendment was moved that another tender to do the same work for £2,720 should be agreed to. It was pointed out by Alderman Keeney that it was distinctly specified in the advertisement that the bricks should be the best obtainable within five miles of Manchester; but the tenderer of the lowest amount offered bricks from his own works, and therefore, if the tender was accepted, the council would be bound to take them, no matter what their quality was. The amendment was lost. There was a difference between the tenders of £830; but it would, on the face of it, have been unjust to the other tenderers to have accepted the lowest tender, as it would have been virtually setting aside the conditions of competition. This instance brings to mind many transactions in which the builder is allowed to use his own bricks or timber in lieu of a particular kind specified. Comment is scarcely necessary. Half the wide tendering we see is due to the habit of specifying one thing and using another. Builders of the acute and crafty turn take advantage of the weakness and vacillation of those who have to carry out the contract or supervise.

On the part of those who submit tenders upon straightforward and businesslike principles, architects ought to exercise extreme vigilance in seeing that the specified materials and fittings are supplied, as by breaking faith in this particular they act unfairly towards them, and encourage the reprehensible practice to which we refer. Fair tendering can only be encouraged and promoted, first, by making the specification clear and explicit; secondly, by insisting that the work is carried out in strict accordance therewith. The form of tender is of no little importance, and we think it would be a desirable thing if the form were more considered than it is. The advertisement inviting persons to tender ought to state that a copy of form of contract and of tender are to be seen at the architect's office, as these are absolutely indispensable to promote a fair competition. As a rule, contractors are allowed to make their own form, which enables them to evade the terms of contract.

A curious instance of arbitrary choice in accepting tenders for schools has come under our notice with regard to the London School Board this week. Two schools, A. and B., in a South-Western suburb, were tendered for on the same day, and one contractor proved lowest in both cases. Oddly enough, his tender was accepted for school A., but passed over in the case of B., the better job of the two (it is significant to note), and the next lowest tender accepted in the second case. The builder very justifiably declined to proceed with A., and the next lowest tender (not by the firm to whom B. went) has been accepted. Does not this suggest, although it may not necessarily imply, favouritism?

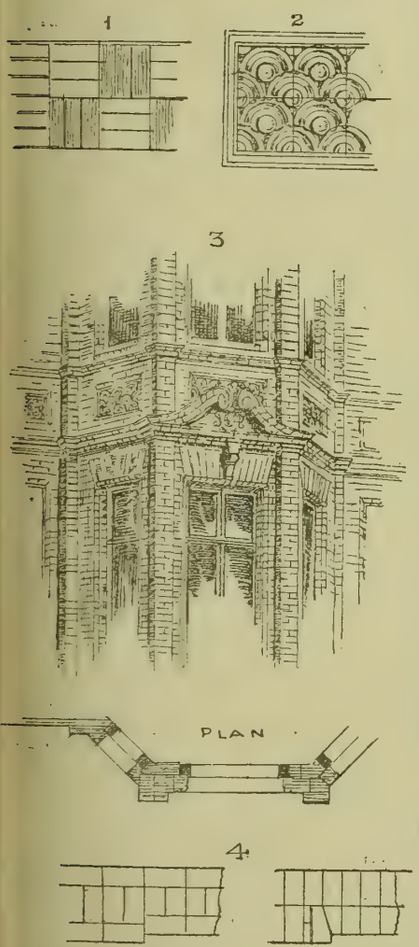
ARCHITECTURAL BRICKWORK.—XX.

PANELS AND WINDOWS.

IN our last article we noticed a few modes of wall ornamentation, and we now give two other examples of the filling-in of panels. The first represents a diaper or cheque pattern, formed of ordinary bricks of two colours placed in alternate squares of horizontal and vertical bricks, forming a panel. The herring-bone pattern is another favourite kind of brick ornament, as we showed in our last article, and for legitimate brick ornamentation we prefer these arrangements of simple bricks to cast ornament. As a example of the latter, Fig. 2 is perhaps one of the least objectionable varieties, as the concentric curves make a contrast to the horizontal courses without being contrary to the idea of bond.

We now come to the window, and we take a bay window as illustrating more completely the principles of setting out bond at the angles—one of the first things a skilled bricksetter should know. Our early diagrams of angle-bond will show the method of forming the angles. Every bricklayer has to exercise his own judgment in arranging the bricks at the corners of a bay window, especially in the

cutting required in the inner angles. The subject is important to the architect, though very few have mastered this detail of practical building. It is true the art of bricklaying and cutting is taught in the technical schools, and to the classes in architecture in the colleges; but we fancy the subject is far too dry to receive the attention necessary. The students have models and detail drawings placed before them; but the actual operation of setting and cutting the bricks of every successive course to an angle bay, for instance, is not described. There were some good models of brickwork in connection with the South Kensington Museum in a temporary building in the Exhibition-road; but on inquiry the other day we found the building empty, and the collection dispersed. Some of the models are, we believe, at the



Central Institution of the City and Guilds of London. A little while ago we saw some excellent specimens of gauged brickwork at the technical schools in connection with the People's Palace, Mile End-road, and in many of the branch technical schools, such as that at Finsbury, models may be seen. The architectural student has few opportunities given him of seeing operations in building; and he draws plans without understanding the rudimentary principles of setting out bond in particular features, or even taking the trouble to calculate how many bricks and half-bricks will be required for a certain pier or given space. Architects will be found equally ignorant of this technical knowledge, for we often see plans of piers and ornamental brickwork in which the size of a brick has not been thought of, so that the bricklayer is obliged to alter the detail by making it agree with the unit of a brick.

Our sketch (3) shows a projecting bay of a house suitable for a street front, of a type that can be seen in many of the West-end suburbs, where red brickwork is largely used. From a strict architectural point of view, the ordinary cant-sided bay is not a satisfactory projection. The re-entering and external angles made with the wall and bay front are weak, both structurally and in appearance, and the experienced bricklayer is not prejudiced in its favour; but the value and convenience of the bay window have overborne all structural disadvantages. In house-building it is exceedingly popular, and few people care to live in old houses, for the simple reason that there is no bay window. They are built to all modern houses of every degree, often badly bonded to the work, and the angles roughly executed. By building them with pilasters, as shown in our sketch, the canted sides have a finished appearance, and the angles are greatly strengthened. These pilasters are continued right up, the cornices returning round them; the outer angle pilasters can be finished with terminals and a parapet built between, Further, the salient obtuse angle between the front of bay and the canted sides is avoided, and well-marked vertical lines given to the window. The cornice with the curvilinear pediment is moulded and rubbed bricks. On each side of bay are blank recesses. As these are important features in architectural brickwork, care should be taken in bonding.

Fig. 4 shows successive courses of a recess of a quarter-brick in a wall of two bricks thick built in English bond. The recessed part of wall is diminished to one brick and three-quarters. In the plans it will be seen that in the recess the headers of both courses are cut to three-quarter bats, which we think is preferable to a continued line of closers in the stretching course. It will be noticed that in the header course the corner headers at the salient angle forming the side of recess, as well as the bricks which meet them at the re-entering angle of recess, are both cut like king-closers, or form a mitre. Next to these outer bevelled bricks closers are introduced. In panels or recesses of half-brick in depth, the three-quarter bats on the recess would give place to half-bricks. In practice different methods are adopted; at all events, it is necessary that the architect should be familiar with the methods of working recesses and pilasters, and the study devoted to this part, however uninteresting, will be repaid by a greater facility in designing brick details that will not give the bricklayer needless trouble.

SIR CHRISTOPHER WREN AND HIS ARCHITECTURE.*

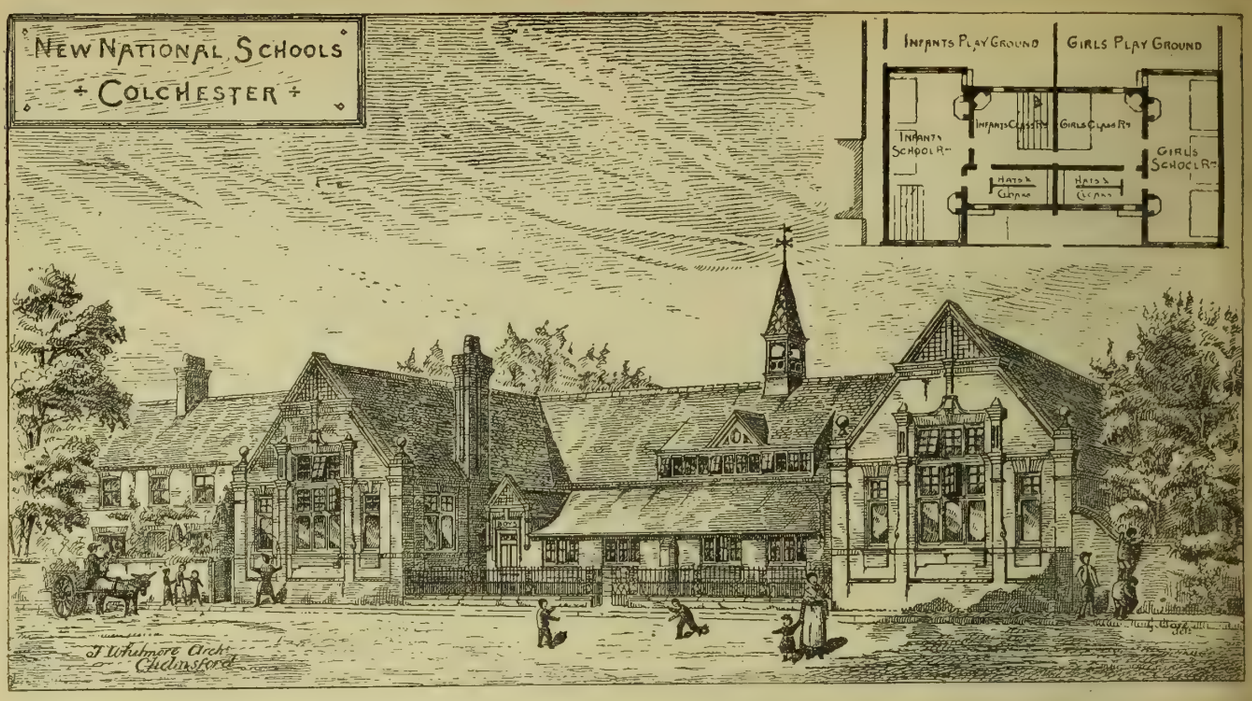
(*Concluded from page* 448.)

TURNING to the plan, the main feature is a large central domed space, in which, no doubt, the congregations, similar to those now often collected under the dome, would have found an even more commodious auditorium than the present one. The leading idea of the dome proposed before the Fire, namely, that it should stand on an octagonal base, is preserved. The recesses in the canted sides are, however, now replaced by arches; but, as before, the four openings to the cardinal points are wider than the four in the intermediate canted sides. At the four cardinal openings occur four compartments or short arms, each with a domical ceiling, and four more somewhat subsidiary domed compartments occur opposite the diagonals, the whole being connected together by vaulting; so that we have a short nave, choir, and transepts, and, at the same time, a kind of continuous aisle carried right round the central space. The piers are pierced by openings, and the whole ground-plan is remarkable for an almost endless variety of form and play of outline. The principal access to the western compartment or space, which replaces what in another building would be the nave, is from a western ante-chapel and a western porch beyond. The most unusual feature in the exterior of this plan is that the four diagonal sides of the main walls have a concave sweep given to them. A remarkable series of vistas, each with a feature at its termination, is secured. A glance at the plan will show that the visitor entering from the west would look through a series of fine arched openings right up to the choir. When he had advanced far enough to pass the vestibule or ante-chapel, two diagonal vistas opening right and left would carry his eye to the north and south transept doors respectively, and when a few steps more had brought the spectator under the dome, openings on every hand would be visible. At every point in walking round the building the same thing would occur, and it is no exaggeration to say that no European building is known of which the interior would have been so varied and interesting. It is not so certain that the exterior would have been a complete success; but it must not be forgotten that Wren's method was to develop and modify his designs largely as he went on (a method, allow me to observe in passing, which was natural and suited to the conditions of the times, but which, under the altered circumstances of our present mode of erecting buildings by lump-sum contract, has to be abandoned as disastrous in its pecuniary results). We may, therefore, fairly assume that had this building gone on, some of the defects in the model would have disappeared. Those who visit Rome, and go round to the back of St. Peter's, which is the only spot from which that dome can be seen as Michael Angelo meant it to appear, may feel that possibly some of the grandeur of effect there experienced would have belonged to this design, in which a vast dome, springing not very far from the ground, was the predominating feature. The model design being, however, definitely put aside, Wren prepared another, of which the sketches, by his own hand, and the fair drawings exist at Oxford. This design received the Royal approval May, 1675, and King Charles II. was, to quote the words of "Parentalia," "pleased to allow him the liberty in the prosecution of his work, to make some variations, rather ornamental than essential, as from time to time he should see proper, and to leave the whole to his own management." There are indications that this design was hastily prepared; but as it was the basis of the present building, it is worth examination. Broadly, the plan is similar to the one now built, the most obvious variation being that the nave has five bays, whereas there are now but three, and a kind of internal vestibule, and that the side chapels and the present semi-circular porches at the ends of the transepts do not occur. In passing I may note that these two western side chapels were forced upon Wren against his wish, and that it is with respect to them—not with respect to the model design, as is often supposed—that the story is told of his being moved to tears when he was obliged to give in. There is, however, another less obvious, but a serious, difference. As first designed by Wren, the lines of the nave and the two side aisles would have been continued their clear width through the openings between the piers under the dome. As actually carried out, these openings are narrowed to some extent, probably because the vast structure actually raised required larger piers than the more moderate one included, or at least shown, on this plan. The plan of the central dome is, however, both in this design and in execution, similar in idea to what it had been in the model design, and in the design made before the Fire—that is to say, an octagon of which all the eight sides had openings, those in the canted sides being smaller than those facing the cardinal points. I may seem to dwell on this a little unduly; but I do so because it has been the custom, perhaps on the authority of Fergusson, to state that Wren owed the idea of a central octagon so disposed that not only could the central avenues all continue through the openings facing N., S., E., and W., but the aisles should all continue through the openings in the canted sides, to Ely Cathedral, where such a feature exists. I believe this idea, which I formerly myself embraced, may prove to be a misconception, and that the true history of the genesis of the dome of St. Paul's is the one I have just given; in which case, Wren's octagon, which is perhaps not an unmixed advantage for his interior, was developed naturally out of his two previous designs, as I have attempted to show. To return, however, for a moment to the approved design: I

* Lecture delivered by Professor T. Roger Smith, at University College, London, Oct. 3, 1889, on the occasion of the opening of the courses of Architecture there for the session 1889-90.

am bound to confess that the front elevation and the design of the dome are so inferior, that one is lost in astonishment at Wren's having been content to allow them to be seen. My own interpretation is that the work was probably done under pressure and in haste; that Wren gave most of his time to the plan, which is really excellent, and that the first idea which presented itself to his mind was drawn by him (for the sketch is undoubtedly from his own hand); that there was no time to criticise it in cool blood and recast it; and that, when he submitted it, he told the king he wished to reconsider it, and so obtained the permission already referred to that he might make alterations. Of this permission he made use in the section, the west elevation, and the treatment of the dome to a remarkable extent, and with the best results. The ground-plan of St. Paul's is remarkably regular and perfectly symmetrical. It has a central dome of something over 100ft. diameter carried on eight great piers, a nave of three bays, and a kind of western transept, a choir of three bays and an apse, and transepts of one bay. Each avenue has side aisles. The western transept consists of an enlarged bay almost like a vestibule, with a side chapel north and south. There is a vast recessed western porch and a portico of coupled columns. The usual section of a church—*i.e.*, that of a nave much higher than the aisles—exists, but is masked by the carrying up the aisle walls; and two orders of pilasters run right round the exterior of the church, giving place to columns in the grandly-designed west porch. This feature is flanked by western towers, each with a singularly graceful campanile as its termination. The dome is lifted upon a perfectly plain base well above the roofs. On this rests a vast circular colonnade or drum, of which every fourth intercolumn is blocked up. Above the entablature, and within it, rises a second drum, from which springs the lofty external dome, crowned by a high lantern, ball, and cross. The construction throughout is excellent; the material employed is Portland stone. Structurally, the most interesting feature is the dome, which is triple. There is, first and lowest, a light dome of brickwork, almost hemispherical, which is what is seen from inside. Above that there is a cone of brickwork which carries the lantern, and outside that cone is the external dome, which is of timber, covered with lead; while the skill with which this vast weight is gradually brought down on to the base of the piers is very great. The effect of the interior is surpassed by that of several great Renaissance churches—far surpassed by that of its gigantic rival, St. Peter's, at Rome. The width of the nave at St. Peter's is much nearer the diameter of the dome than in St. Paul's, and consequently there is no sense of the one being disconnected from the other, which is the chief blemish at St. Paul's; while the entire absence of colour strikes one very painfully. The exterior, on the other hand, is by far the finest that any Renaissance architect has produced, and forms a noble centre to the buildings of the metropolis. There are, as usual in Wren's work, many direct geometrical relations between different parts of St. Paul's, and there are some exact dimensions which are a little noteworthy as being simple figures laid down originally and not departed from. Time will not permit of an examination of the secular work designed and carried out by Wren, nor is it possible to refer to his churches in great detail within the usual limits of a single lecture. They form, however, so remarkable a series of buildings that they must not be passed over entirely. Fortunately, Clayton's work affords the opportunity of considering the whole of these parish churches as a group, since plans, elevations, and sections of every one are given, with in some cases details. Turning in the first instance, as an architect instinctively does, to the plans, one is struck at the outset by the immense variety which they exhibit, and the great skill shown in producing effect by the simplest means; and a further examination reveals the wonderful picturesqueness attained in a style to which most architects would say the picturesque is foreign, while the formal and the symmetrical are its natural expression. It must not be forgotten that these churches not only occupy old sites, but stand with their walls, and even their columns also, in some cases, on old foundations, so that the ruins which had to be dealt with limited the architect to a great extent. To an ordinary designer these limits would have been fetters; to the man of genius they were suggestions, and though we can never have the means of knowing precisely how much of all this clever planning is entirely original, and how much grew partly out of the condition of each building-site, there is none the less credit due to Wren for this remarkable series of church plans, and his perfect and entirely novel adaptation of the style in which he worked to those plans. In not a few instances the site was nearly square, but as often as not it failed to be truly rectangular, and we have to admire many clever devices for masking the irregularity, and others for making an interesting interior out of a mere square room. In not a few instances there is an aisle at one side only; in some there is no aisle, but columns, of which the entablatures are so disposed as to break up the interior in some way. Of the churches of moderate size, that of St. Stephen Walbrook is the most beautiful and the most famous. Here the whole effect of the interior is due to the skilful employment of columns and to the domical ceiling which they carry, so that within the limits of four plain walls the architect has known how to produce the effect of a nave, choir, and transepts, with a dome over the intersection. The ground-plan of St. Stephen's is that of a rectangular room, measuring 82·7 by 60·0ft., with a projection, consisting of the tower and porch, at the west end. This is transformed into what I have described by means of the introduction of 16 Corinthian columns on pedestals, and carrying a compressed entablature, above which rise arches. Eight of these columns are so placed as to carry the pendentives under a flattish dome of about 43·0ft. diameter, lighted by a lantern; and the columns are so disposed that by the simple device of returning the entablature back against the side and end walls, all the effect of nave, choir, and transepts is produced. The lighting is well disposed, all the windows being high up, and as usual the fine oak and panelled dado forms a dark and vigorous base for the architectural features to rest upon. I have searched on Mr. Clayton's drawings for some of those geometrical relations between the main dimensions which are generally to be found in Wren's designs, and I believe always exist there—discovered or not; and I have found that the radius of the opening of the dome appears to have been used as a dominant dimension. This radius is exactly one-third of the width of the interior; the height of the dome from the cornice upward exactly equals that radius, and the height from the floor to that cornice is very slightly more than twice the same dimension; so that the diameter of the opening through which the dome is seen is two-thirds the width of the building, and is (within about 6in.) equal to its own height from the floor; and as there may be some slight inaccuracies, I fully believe this was intended to be exactly so. There can be little doubt that in such geometrical relations of one part to another as these lies no small part of the subtle charm of Wren's best interiors. Attached to this church is an extremely plain tower, surmounted by a comparatively small but very graceful stone terminal, which forms a very good example of Wren's treatment, both of the design and construction of such spires. The tower finishes with a balustrade. Within this, on a stilted pedestal, rises a smaller square structure, with three engaged shafts at each angle, and pilasters within them again. These carry an entablature, and above that comes a second story, consisting of a kind of attic, surmounted by a gradually diminishing finial. The whole outline above the top of the first order is carefully kept within a pair of raking lines which (having seen how Wren uses them in his design at Oxford for a somewhat similar but richer spire) there is no difficulty in applying. The construction appears to depend upon a device which is met with frequently—a truncated dome springing from the walls of the tower, and carrying the weight of the inner part of the spire. Of churches of the largest type the two best are St. Andrew's, Holborn, and St. James's, Piccadilly. In each of these we have an arrangement very nearly like that of a Roman basilica, the church having a regular nave and aisles, and deep galleries filling the upper part of the aisles and the western end of the church. The exterior of these churches of Sir Christopher Wren did not, as a rule, receive much elaboration. Contrary to a good deal of modern church building practice, Wren seems to have considered a church as an *interior* first. He adapted it as well as he could to the purposes of those who were to make use of it. He lavished upon the interior the best resources of his art, and, as a rule, probably devoted the chief part of such outlay as he could dispose of for purposes of architectural effect to making that art sightly and seemly, and he appears to have cared but little for the effect which the exterior was to produce. To this, however, there is in his practice one notable exception—his treatment of the steeple. Probably most of the Mediæval churches of London which perished in the Fire had each a tower—and in many cases a spire or lantern; however this may have been, it is an all but universal rule with Wren to provide a tower, and, in many cases, to crown it with an ornamental structure, and on this part of the exterior of a church he customarily bestowed the greatest pains—indeed, it is in the designs of his towers and spires that Wren's originality is most shown. It was a remark of that acute critic, Professor Cockerell, that in the design of a tower and spire for a town church, the entrance, if the lowest story served as a porch, should receive architectural enrichment; all passed it, all could see it, its treatment appealed to every person entering the building. The upper part again, raised high above the roof, is the token that here is a church, and is the appropriate ornament of such a building seen against the sky-line, and as such should be rich and of effective outline. Between these extremes the main wall of the tower is of little use save to lift its crowing feature well above the roofs of the houses among which it stands, and there is no reason, therefore, for it to be other than plain. Almost every one of Wren's church towers conform to these maxims: take Bow church as an example. The entrance is rich and noble. The crowning feature is characteristic and highly worked up. The intermediate mass—that is to say, the upper stories of the tower, cannot be termed anything else than plain. In not a few of the churches that had perished the tower had been surmounted by a spire, in others by a lantern, and I think I am correct in saying that no Renaissance building which Wren could have seen would furnish the smallest suggestion as to how to make out of Classical materials a spire appropriate to the tower of a parish church, though in Jacobean buildings there were examples of the successful treatment of the lantern. Something like Wren's solution of the problem appears in views of some Spanish buildings; but it is in the highest degree improbable that such examples were known to Wren, even if they were in existence in his day. It is also remarkable that, supposing the dates in Mr. Elmes's life of Wren to be correct, the earliest London church to be completed was one of which the spire is inferior to none in beauty, elaboration, effectiveness, and appropriateness. I refer to Bow Church, which according to the above authority, was finished as early as 1677. Of this steeple there is an illustration and description in Fergusson's "Modern" volume, and it was excellently illustrated by Mr. J. T. Christopher some years ago. Simpler than this, but extremely graceful, is the spire of St. Bride's, Fleet-street, with its three arcaded stories alike in design, but each smaller and lower than the one below. Above these comes a fourth story, somewhat simpler, crowned with a little spire. The outline of this composition adheres more closely to the straight line of an ordinary spire than any other, and a great charm is produced by comparatively simple means. In the sections nothing strikes the eye more than the constant appearance of a finely-designed dado of oak panelling, beautifully proportioned, which forms a base to the internal walling, and usually clothes the pedestals on which the internal columns stand. Much bold carpentry must exist in the roofs, of which in some few cases we can obtain indications, and which appear, as a rule, to have stood well. But it must not be forgotten that this carpentry was executed at a time when oak was the timber habitually used—a timber of great strength, and capable of remaining unmoved at the joints when framed together. Now we employ fir timber which is weaker, and in which, unfortunately, the joints cannot be trusted to resist much strain owing to the soft nature of this wood. The most famous, and probably the most ingenious, of Wren's timber roofs contrived to support a plaster ceiling of elaborate design is that over St. James's Church, Piccadilly; but though this church is one of the best examples of Wren's good sense and skill as a constructor, its exteri

is painfully inferior to its interior in design. Here, somewhat unwillingly, I must stop in my examination of Wren's buildings. I will content myself with naming Greenwich Hospital, Chelsea Hospital, the Sheldonian Theatre, Oxford, and the additions to Hampton Court as specimens of his important secular works. It would, however, be impossible to say anything that would have any value as criticism about these works which Wren carried out, unless I were to omit all mention of Wren's drawings, which, on various accounts, I am unwilling to do. It appears to me that they form a part of the subject of much interest to us who are mostly ourselves engaged in making architectural drawings. There exist at St. Paul's two large volumes of working drawings which were used on the building, and these, by the great kindness of Mr. Penrose, I was permitted to examine a few days ago. Many of them are clearly from Wren's own hand, and in the case of others, which appear to be draughtsman's work, one frequently finds along with the drawing the original draft by the master. Few of these are large drawings, though some of them are to a large scale; but, as a rule, each drawing deals with a portion of the building, and does so very thoroughly. The great bulk of what I examined are masonry drawings. The drawing is clear, definite, and unhesitating; a very clear line is used, and the profiles of mouldings are drawn with such precision that some of the ½in. scale masons' elevations—for example, those showing the entablature of the order used—might almost have been worked from without profiles being furnished. One of the most interesting of these drawings is a plan of part of the piers supporting the dome, with superposed over it a plan of the structure at a higher level showing exactly how much of the drum rested directly over the great piers, and how much on the great arches that go from one to the other. An extremely interesting drawing, in part, I think, by Wren, and one among the few that could be called general drawings, is a careful elevation of the entire west front in outline, the treatment up to the apex of the pediment being what we see; but the upper part, showing the dome and western towers before the last revision. A remarkable detail drawing, full of energy and vigour, and yet precision, and undoubtedly an autograph, and necessarily executed when Wren was an old man, shows the ball and cross on the summit of the lantern, with the whole of the rather elaborate system of ties and bolts, by which they are held down, and the foundation upon which they are formed. It is remarkable to note how thoroughly the author of all these working drawings seems to have been aware of just what guidance the mason or other workman required, and carefully, definitely, and unmistakably that guidance was given. Sir Christopher Wren as a draughtsman may perhaps, however, be best understood by a study of the large but miscellaneous collection of his drawings in the library of All Souls College, as there studies, general drawings, first sketches, and finished plans are all to be seen. These, by the courtesy of the authorities, I have very recently inspected and examined for the purposes of this lecture. In four large folio volumes are stored part of the contents of the great architect's portfolios; fortunately, that part includes a good many drawings belonging to the series made for St. Paul's, along with many connected with his other works. In one or two cases we can here trace the way in which he worked, and though there may be a doubt about some drawings, whether they are his own handiwork or no, and a certainty about others that they are the work of an assistant, there remains a large body of work about which no one accustomed to architectural design can entertain any hesitation as to their being the manuscript work of the master just as he left it. Curiously enough, there is extremely little writing on these drawings, though I note with some interest, as falling in with a strong prejudice of my own, that there is a scale on not a few. The autograph drawings were evidently for the most part rapidly produced, yet with a strong leaning towards precision and exactitude. Nearly all of them are in ink, and brown ink is usually employed, and the elevations are often washed a little in Indian ink, while plans and sectional parts are sometimes left uncoloured, sometimes coloured red, and not unfrequently etched. There is a great preponderance of plans, and the geometrician shines out in all of them. In not a few cases the centre lines and setting-out marks remain in pencil, and it is interesting to note how constantly Wren worked from centres and centre lines. In his sketch of the approved plan of St. Paul's, for example, a centre line in pencil runs up the nave and choir, and a similar line up each aisle from end to end of the plan; but it is in his sketch of the ground-plan of the earlier design, which we may call the model design, that these centres and centre lines are most visible and most interesting. It is possible on this drawing to learn the whole process adopted in setting out that intricate and remarkable plan. An elevation, clearly and firmly drawn, and vigorously shaded in lines, accompanies this plan, and there is also a section washed. These drawings strike one as perhaps the most masterly in the series, and are, without doubt, autographs. I have already alluded to Wren's autograph drawing—for it is clearer than a sketch—for the approved plan. There is also a sketch by him of the singularly weak elevation which accompanied it. The finished drawings submitted to the king are here. They may or may not be his handiwork—probably not. A very interesting drawing in connection with St. Paul's is a pencil study in perspective of the interior of the present cathedral, lusty in execution, but true. There are other studies in perspective in the series, bearing out an injunction of the master's in one of his essays on architecture. "The architect ought above all things to be well skilled in perspective, for everything that appears well in the orthography may not be good in the model, especially where there are many angles and perspectives; and everything that is good in model may not be so when built, because a model is seen from other stations and distances than the eye sees the building. But this will be universally true, that whatever is good in perspective, and will hold so in all the principal views, whether direct or oblique, will be as good in great (i.e., *in execution*) if this only caution be observed—that regard be had to the distance of the eye in the principal stations." Not the least instructive piece is a very small perspective study of Greenwich Hospital, intended apparently to show him how the two domes would look. Another drawing of St. Paul's, which, though probably an assistant's work, possesses historical value, is a careful south elevation of the cathedral, corresponding to the outline west elevation already named by me. Up to the parapet, this drawing, which is carefully tinted and shaded, shows the building very nearly as erected; but it is interesting to note that the design of the upper part, both of the dome and the west towers as they stood at that time, was not what was ultimately carried out, and not anything like so good. Where the drum surrounds the building there was then prepared a series of buttresses, each one ending in an engaged column. This feature—of which, by the bye, a plan exists in the St. Paul's collection carefully elaborated—has now given place to a smaller number of large piers with columns between. There are some other differences in the dome, and especially in the lantern; but the change in the west towers is even more marked. At the time when the drawing was made it was intended that a small dome should surmount each western tower, and the extremely elegant composition in which these towers actually finish is not figured on the drawing. Perhaps in nothing did Wren make a greater improvement than in the design of these campanili. In connection with the dome of St. Paul's I may name an extremely careful study (which I entertain little doubt is an autograph) of the two great domes of St. Peter's at Rome and Sta Maria dei Fiori at Florence. At the bottom of the sheet is a quarter plan of the one and a quarter plan of the other, and set up over each is drawn carefully a half-section, a centre line separating the two; while on a separate part of the sheet is a portion of the plan of each dome at a higher level. This drawing is carefully and broadly executed. As usual, it is in brown ink; it is slightly shaded in sepia, and the sectional parts are tinted in a colour something like Venetian red. The baldacchino, and other ornaments in the interior of St. Peter's, are most beautifully drawn; but the human heads, &c., are not well done, and it is noteworthy that wherever the figure is introduced into the undoubtedly autograph drawings the draughtsmanship is imperfect. Nothing could be better as a study of great domes than this drawing, and the pains taken with the work, and the precision and care of the execution, are most instructive, as showing the trouble which a great man considered he ought to take in order that he might master the two most famous domes in Europe, which he studied as examples of work similar to what he was himself charged with. In a different way one of several carefully-finished drawings for Bow Church is interesting. I have it from Mr. Christopher that there is a tradition that when Bow Church was first designed, Wren proposed a lantern on the tower; but the parish, being wealthy and influential, desired to have something more ambitious. Accordingly Wren redesigned the spire, adopting something of the same outline, but vastly expanding it. Being, however, pleased with his lantern, he employed it for the tower of another church, St. Magnus, London Bridge. Accordingly here is an elevation of Bow Church, with the lower part of the tower as built, but the upper part quite different, and bearing a close resemblance to the picturesque lantern so conspicuous an object to those who daily cross London Bridge, which crowns the above-named church. A drawing which is extremely instructive, as showing how Wren worked, is an unfinished pencil study of the campanile of a building (No. 85, in the 4th volume). This was to have been in four stories of unequal height, and it bears so great a resemblance to the lower part of St. Bride's spire that I take it to be an early study for that design. Half the drawing was to have been a section on half his elevation. How the proportion between the heights of the stories was arrived at the drawing does not show; but their projection was regulated by drawing a sloping line from the top of the tower (exclusive of a cornice) to some point (out of the paper) on the centre line, and the projection, and consequently the height, of each cornice, was regulated by a second similar line from the edge of the lowest cornice. I had long been aware that the section of the dome of St. Paul's conforms to a similar line, and it was, therefore, extremely instructive to find another composition in course of being worked out by the aid of such a line, and to find the whole machinery of working left visible. Another noteworthy feature of this unfinished design is that Wren had apparently intended as his manner was to carry the highest story of this construction by means of a kind of internal tower resting on a stone vault, or else to provide for a stone stair resting on a masonry arch; and in this section he had taken the trouble not only to show the outline of the vault or arch, but to indicate every voussoir, and to show how he proposed to work the extrados of each stone so as to form a kind of step. A staircase in exactly this position is shown in Clayton's drawing of St. Bride's church spire. Another instructive pencil drawing in this series is one identified by Mr. Penrose as a plan of the north-west tower of St. Paul's. This exhibits the construction of the tower at four levels. It was rapidly done, and, contrary to custom, no attempt to ink it in has been made; but it shows what it is meant to show sufficiently to enable a working drawing to be made from it, possibly sufficient to guide a good mason accustomed to Wren's work without further details in setting out the masonry and building it. A set of six very careful drawings, which Elmes refers to the year 1665, embodying the design of a library for St. John's College, Cambridge, deserve a notice as an early work, and as being accompanied by a report which exists in Wren's handwriting, and is printed in Elmes's Life. From this report it appears that no such thing as keeping copies or duplicates was in use in Wren's time, as he asks that when enough has been taken off from these drawings to permit a start to be made, the originals may be returned to him in order that he might give details for the mouldings. With these drawings there is a very spirited sketch in perspective, doubtless from Wren's own hand, of a reading-table and desk, such a drawing as would be a sufficient guide to a good workman. The collection includes a series of large and highly-finished drawings for Greenwich Hospital, probably prepared to show to the king, and entirely draughtsman's work. There are plans of alterations, surveys, and miscellaneous traces of a large practice, and of the various calls which it makes on time and trouble. One considerable plan is noteworthy for being sketched on paper previously divided up with pencil lines into squares, just like what is called section paper by engineers at the present day. There are a good many sketches of plan, mostly in ink, drawn to



a small scale, and apparently without the use of a ruler, such as lead one to surmise that Wren possessed the faculty which is, from time to time, met with in architects, of being able to sketch the plan of an existing building or locality approximately true to scale, with but few dimensions to guide him. I ought not to omit that a few pencil sketches—mostly of scenes, including some building, usually some mansion, but in some cases of picturesque spots interesting to a passing traveller—are preserved. I am inclined to believe that these are all Wren's. They are boldly and roughly drawn in pencil, trees are indicated by an impatient scribble, and the buildings are hurriedly drawn, but sufficiently well to show what they were, and the perspective is always good. These must not be looked upon as studies: they are a traveller's jottings. The shape of them is curious: they are almost all long and narrow, and with a crease in the middle, as though a sheet of paper had been cut into long strips, and then each one doubled and shut into a book or folio till wanted. The sum of these rather desultory observations may perhaps be this. The drawings show Wren to have been a rapid, free, but very accurate geometrical draughtsman. Geometry seems to be suggested by his methods as the inspiring motive of his work, as one might indeed expect to find it, when one reads in one of his fragmentary essays the following words: "It seems very unaccountable that the generality of our late architects dwell so much upon the ornamental and so lightly pass over the geometrical, which is the most essential part of architecture." The contents of these folios testify to a fertile invention; but, I am inclined to think, not a fastidious taste. Wren seems, probably from having a great pressure of work to encounter, to have been apt to content himself with the first idea, and that not always a good one; but it is to be observed that in execution he generally revised and refined where, as in the case of St. Paul's, his constant supervision of the work gave opportunity for doing so. It appears pretty clearly also that structure was never absent from his mind. Not only were his designs things that could be built, but from the first the question of how to build them was considered at the same time as the question of what shape to give them, and long before the question of what ornament to bestow. The two or three professional reports and estimates preserved at Oxford concur with the various papers given in the "Parentalia," to produce the impression upon us of a most trustworthy, methodical, sagacious, energetic man of business, and it is almost as interesting to turn over these fragments of his writing and calculating as to scan his drawings. The whole thing brings the man himself very near to one; you trace the lines he drew, note the very holes left by the point of his compasses, you try to infer his modes of thinking and working from the traces here left, and you come away feeling as if you had had a glimpse into his very mind, and had seen him alive and at work; a feeling to which the cast of his features taken after death, and preserved in the Library, gives a pathetic tinge, for so startlingly real is it that the sight of it is much as though one had seen the old artist in his coffin. Here, gentlemen, I propose to leave the subject, and if, in addition to giving you some information, I have succeeded in to any extent awakening your interest, and possibly have caused you to reflect that some lessons for the guidance of a 19th-century student of architecture may be gathered from the example of this keen investigator and strenuous worker of the 17th, my object in asking you to meet me to-night will have been fully attained.

MARBLES AT THE PARIS EXHIBITION.

THE London Working Men's Association sent a month since a deputation of ten members to visit the Paris Exhibition, each being instructed to give an independent report on the various exhibits in connection with the trades which most affect the working classes of the metropolis. Each member of the deputation paid his own expenses. An advance proof of the reports has just been published, headed by a general outline of the exhibition by Mr. George Potter, the president. The report on Marble Masonry is by Mr. George Mitchell, of Brompton ("One from the Plough"), who remarks on the solidity displayed in the construction of the Exhibition buildings, many portions of which have granite plinths and bases. The qualities of the marble, granite, and stone exhibited are not, he thinks, to be compared with our own products, which are conspicuous by their absence, and in an aside Mr. Mitchell urges building owners to prohibit their architects from putting in their specifications foreign marbles, while we have better, cheaper, and very abundant marbles in the United Kingdom lying undeveloped, as for example the Connemara green marble, and those of Cornwall, Devon, Derbyshire, and Wales and Scotland, none of which have been properly brought into public notice. Recurring to the Exhibition, Mr. Mitchell says:—In the Belgian Department Leon Boncereau exhibits a very good block of Brissia de Herculaneum, generally called brown Brocatella, a very excellent marble for columns; it is 13ft. long by 3ft. square. Adjoining are some very large specimens of various Belgian marble slabs in rouge royal, rouge griotte, black, and one blanc, varying in size from 12ft. to 18ft. long, and from 3ft. 6in. to 7ft. 6in. in width, exhibited by the Société Anonyme, late Messrs. Puissant Frères, marbes le chateau. The above firms are two of the principal manufacturing firms for the English markets. Some very fine specimens of chimney-pieces are exhibited by Mr. Devilliers, of Brussells, and Evrard Leonce. M. Gruyers, of Louvain, exhibits some very excellent carving in wood and stone in pulpits and other church work. Belgium shows more than any other nation in this particular trade. The specimens of marble shown in the French Department of the Exhibition far surpass in quality any found in Belgium. The Belgian products are, indeed, very inferior to those of France. They have to import all their best marbles from France, Italy, and Spain. The French use their beautiful specimens of marble in decorations with charming effect; the inlaid work is done remarkably well. The African marbles are plentiful and good; but, like our own, are little developed as yet. Continental masters seem anxious to contribute to the happiness of their workpeople. Certainly there appears to be a better understanding between the masters and men in these countries than in England. The men stated that the masters, as a rule, employ them winter and summer; twelve hours in summer, and as long as they can see in the winter. If busy, they work by gas or other light. Men's wages vary from 5d. to 7½d. per hour; the women, who sand or polish, from 1½d. to 3d. per hour. The machinery for working marble is superior to any in England, effecting a great saving in labour. Another system is very largely adopted, this is—many live out of town or away from centres as much as from six to ten miles—the materials are cut to size, and taken round to the various homes at various times to suit all—by this means the masters get it done 10 per cent. cheaper. When work is slack these people are the first to suffer; but they have a few acres of land on which to go, thus putting them in a better position than the constant hands in the towns. This system also prevents overcrowding in the large centres of industry, and contributes largely to the absence of squalid poverty.

NATIONAL SCHOOL, COLCHESTER.

THIS school is designed to accommodate 150 infants and 150 girls, and is to be erected in Kendall-road, Colchester. The materials to be used are local red bricks, roofs covered with slates, and the floors of wood blocks on concrete. The architect is Mr. Frank Whitmore, of Chelmsford, and the design was selected in open competition.

An organ was formally opened in Lauriston U.P. Church, Edinburgh, on Friday. It has been built by Messrs. P. Connacher and Co., of Huddersfield, and cost £1,000.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—LV.

By Henry Lovegrove, F.S.I., Surveyor.

A VILLAGE ELEMENTARY SCHOOL.

WINDOWS CONTINUED.

FOUR LIGHT WINDOWS, BOYS' CLASS-ROOM.

ft.	in.	ft.	in.	
4	13 9	4	7	
	4			
	3			Wrot. and moulded frame as before.
4	10 3	3	5	
	4			
	3			Add for upper part.
4 2	2 6	20	0	Oak sill as before.
4 2	2 6	20	0	Galvanised iron tongue and groove in oak, and stone sill and white lead, and bedding sill in white lead.
				8. Frames bedded and pointed.
4	2 1			
	4 5	3	5	
4	2 1			2in. moulded casements as before hung.
	2 8	22	2	
				8. Pairs 3 brass butts.
				4. Tonks' brass wedge casement fastening.
				4. Do. stays.
				4. Elsey's patent opener for casement on butts, 11ft. from floor.
4	1 11			
	4 3	32	7	
4	1 11			Hartley's glass in small squares as before.
	2 6	19	2	
				8. Frames 4c. white.
				8. Do. S. S. and 2ce varnish.
				56. Small squares 4c. white.
				56. Do. S. S. and 2ce varnish.
	27 9	27	9	3in. by 1in. wrot. and rounded linings tongued as before.
	28 11			Deal wrot. and moulded grounds as before.
	4½	10	10	
	28 11	28	11	3in. architrave moulding mitred as before.
	11 0	11	0	4in. by 2in. deal mouldings on transom.
				2. Ends fitted.
2	4 9	9	6	
2	3 0	6	0	4½in. by ¾in. deal wrot. grounds moulded both edges as before.
				8. Ends fitted.
2	4 9	9	6	
2	3 0	6	0	3in. architrave moulding mitred.
				8. Ends fitted.
	4 9	4	9	
	3 0	3	0	Deal moulded both edges grounds 10in. wide.
				4. Ends fitted.
2	4 9	9	6	
2	3 0	6	0	3in. moulded architrave.
				8. Ends fitted.
	12 5	12	5	1ft. 4in. window-board as before.
				2. Mitred and returned moulded ends.
				2. Notchings.
	12 5	12	5	Deal moulding planted on under window board.
				2. Mitred and returned moulded ends.
8	2 6	20	0	Groove in oak for window board.
8	2 1	16	8	Smith's water bar as before.
	27 9			
	4	9	3	S.S. and 2ce varnish on linings.
	28 11			
	1 0	28	11	Add on grounds as before.
	11 0			
	8	7	4	Add on moulding.
2	4 9			
	1 0	9	6	
2	3 0			Add on architrave, &c.
	1 0	6	0	
	4 9			
	1 4	6	4	
	3 0			S.S. and 2ce varnish.
	1 4	4	0	
	12 5			
	1 6	18	8	Add on window nosing, &c.
	10 9			
	8 0	86	0	1½ B. in mortar ddt.
	12 10			Ddt. random Kentish rag facings as
	8 0	86	0	before.
	11 1			
	8 3	91	5	Ddt. R. F. and S. and 2ce distemper.
	13 5			
	6			
	4½	2	6	Fir lintel.
	13 5	13	5	Extra to rough relieving arch as before.
				6. Wood fixing ships.
				18. Lead plugs and runs in Bath stone as before.

TWO THREE-LIGHT WINDOWS, GROUND FLOOR.

2 3	13 9			
	4			
	3	6	11	Frame as before.
2 3	10 3			
	4			
	3	5	1	Add. do.
3 2	2 6	15	0	Oak sill as before.
				12. Frames bedded and pointed as before.
2 3	2 1			
	4 5	55	2	2in. deal moulded casements as before hung.
2 3	2 1			
	2 8	33	4	2in. do. add.
				12. Pair's 3in. brass butts.
				6. Tonks' brass wedge casement fastenings.
				6. Do. stays.
				6. Elsey's patent openers for casements, 11ft. from ground.

ft.	in.	ft.	in.	
6	1 11			
	4 3	48	10	Hartley's glass as before in small squares.
2 3	1 11			
	2 6	28	9	Add. do. do.
				12. Frames 4c. white.
				12. Do. S.S. and 2ce varnish.
				84. Squares 4c. white.
				84. Do. S.S. and 2ce v.
2	24 10	49	8	3in. by 1in. deal lining as before.
2	26 0			
	4½	12	0	Deal moulded grounds as before.
2	26 0	52	0	3in. moulded architrave as before.
2	8 0	16	0	Deal moulding on transom.
				4. Ends fitted.
2 2	4 9	19	0	4½in. by ¾in. grounds moulded both
2 2	3 0	12	0	edges.
				16. Ends fitted.
2 2	4 9	19	0	
2 2	3 0	12	0	3in. moulded architrave.
				16. Ends fitted.
2	9 6	19	0	1¼in. window board as before.
				4. M. and returned moulded ends.
				4. Notchings.
2	9 6	19	0	Deal moulding planted on under window board.
				4. M. and returned moulded ends to do.
2 3	2 6	15	0	Groove in oak sill for do.
2 3	2 1	12	6	Smith's water bar.
2	24 10			
	6	24	10	S.S. and varnish on linings.
2	26 0			
	1 6	52	0	Add on architrave.
2	8 0			
	8	10	8	Add on moulding.
2 2	4 9			
	1 4	19	0	
2 2	3 0			Add on architrave.
	1 0	12	0	
2	9 6			
	1 6	28	6	Add on window board, &c.
2	8 0			
	8 0	128	0	1½ B. ddt. in mortar.
2	9 10			Ddt. extra to random, rubble facing
	8 0	157	4	as before.
2	8 0			
	8 3	132	0	Ddt. R. F. and S. and 2ce distemper.
2	9 6			
	6			
	4½	3	7	Fir lintel.
2	9 6	19	0	Extra to rough relieving arch as before.
				12. Wood bricks.
				24. Lead plugs and runs, &c., as before.

ONE-LIGHT WINDOWS.

CLOAK-ROOM AND LAVATORY LOBBY.

2 2	10 6			
	4			
	3	3	6	Fir frame for window as before.
2 2	2 4	9	4	5in. by 2½in. oak, wrot., framed, grooved, weathered, and throated sill as before.
2 2	2 4	9	4	Galvanised iron tongue and groove in oak and stone, and white lead, and bedding sill in white lead.
				4. Frames bedded and pointed as before (small).
2 2	2 0			2in. deal moulded casement as before,
	3 6	28	0	hung on butts.
				4. Pairs 3in. brass butts.
				4. Tonks' brass casement wedge fastener.
				2. Do. stays.
				2. Elsey's patent opener 11ft. from floor.
2 2	1 11			Hartley's glass as before in small
	3 4	25	6	squares.
				4. Frames 4c. white.
				4. Do. S.S. and 2ce varnish
				24. Squares (small) 4c. white.
				24. Do. S.S. and 2ce varnish.
				No grounds required.
2	17 10	35	8	3in. architrave moulding as before, mitred.
2	2 4	4	8	4in. by 2in. deal moulding planted on transom.
				4. Ends scribed to architrave.
2	3 4	6	8	1¼in. deal, wrot. and rounded window nosing tongued on.
				4. Mitred and returned rounded ends to do.
2	3 4	6	8	Deal moulding out of 2¼in. by 2in., planted on under same.
				4. M. and returned moulded ends to do.
2	2 4	4	8	Groove in oak for window nosing.
2	2 2	4	4	Smith's patent water bar.
2	17 10			
	6	17	10	S.S. and 2c. varnish on architrave.
2	2 4			
	8	3	1	Add.
2	3 4			
	1 0	6	8	Add on nosing.
2	2 2			
	7 3	31	5	1½ B. in mortar, ddt. averaged.
2	3 8			Ddt. extra to Kentish rag facings as
	7 0	51	4	before.
2	2 6			Ddt. extra to fair face, and twice dis-
	7 3	36	3	temper an approved tint.
2	2 6			Extra to neatly axed fair arch in
	9	3	9	stocks in 2 rings in cement.
2	2 4			
	4½	1	9	Add soffit.
2	2 4	4	8	T-piece 4½in. soffit.

ft.	in.	ft.	in.	
2 2	9	3	0	Fair cutting in stocks.
2	2 6			Rake out cement joints and point in
	9	3	9	mortar.
				12. Wood fixing slips.

TWO WINDOWS AS LAST ON FIRST FLOOR.

2	10 6			
	4			
	3	1	9	Window frame as before.
2	8 6			
	4			
	3	1	5	Add do.
2 2	2 4	9	4	Oak sill as before.
2 2	2 4	9	4	Galvanised iron tongue and groove in oak, and white lead and bedding sill as before.
				4. Frames bedded and pointed.
2	2 0			
	3 6	14	0	
2	2 0			2in. deal moulded casements as before.
	2 6	10	0	
				4. Pairs 3in brass butts.
				2. Tonks' casement fastener.
				2. Do. stay.
				2. Elsey's opener, 11ft. from ground as before.
2	1 10			
	3 4	12	2	
2	1 10			Hartley's glass in small squares.
	2 4	8	6	
				4. Frames 4c. white.
				4. Do. S.S. and 2ce varnish.
				28. Small squares 4c. white.
				28. Do. S.S. and 2ce varnish.
2	15 10	31	8	3in. architrave moulding as before.
2	2 4	4	8	4in. by 2in. deal moulding on transom.
				4. Ends scribed to architrave.
4	3 4	13	4	1¼in. wrot. and rounded window nosing.
				4. M. and returned rounded ends.
2	3 4	6	8	Deal moulding under ends of do.
				4. Mitred and returned moulded ends to do.
4	2 4	9	4	Groove in oak for window board.
2	2 2	4	4	Smith's patent water bar.
2	15 10			
	6	15	10	S.S. and 2ce varnish on architrave.
2	2 4			
	8	3	1	S.S. and varnish add.
2	3 4			
	1 0	6	8	Add on window nosing, &c.
2	2 2			
	6 9	29	3	1⅛ B. ddt. in mortar.
2	3 8			Ddt. extra to Kentish rag facings a
	6 6	47	8	before.
2	2 6			
	7 3	36	3	Ddt. R. F. and S. walls and distemper.
2	4 0			
	6			
	4½	1	6	Fir lintel.
2	4 0	8	0	Extra to rough relieving arch as before.
				12. Wood fixing slips.

ELEVEN ONE-LIGHT WINDOWS.—GROUND FLOOR.

11 2	6 6			
	4			
	3	11	11	Frame as before.
11 2	1 4	29	4	Oak sill as before.
11 2	1 4	29	4	Galvanised iron tongue and grooves in oak and Bath stone, and white lead and bedding sill.
				22. Frames, small, bedded and pointed.
11 2	1 0			
	3 6	77	0	2in. moulded casements as before.
				22. Pairs 3in. brass butts.
				11. Tonks' patent casement fastener.
				11. Do. stays.
				11. Elsey's opener.
11 2	10			
	3 4	28	10	Hartley's glass as before.
				22. Small frames 4c. white.
				22. Do. S.S. and 2ce varnish.
11	16 10	185	0	3in. architrave, moulding mitred.
11	1 4	14	8	4in. by 2in. moulding on transom as before.
				22. Ends scribed to architrave, &c.
11	2 4	25	8	Deal tongued and rounded window nosing as before.
				22. Mitred and returned rounded end to do.
11	2 4	25	8	Deal moulding under do.
				22. Mitred and returned moulded ends to do.
11	1 4	14	8	Groove in oak for window-board.
11	1 6	16	6	Smith's patent water bar.
11	16 10			
	6	92	7	S.S. and 2ce varnish on architrave.
11	1 4			
	8	9	9	Add.
11	2 4			
	1 0	25	8	Add on window nosing, &c.
11	2 6			Ddt. extra to Kentish rag facings as
	7 0	192	6	before.
11	2 6			Ddt. extra to fair face and 2c. dis-
	7 6	206	3	temper.
11	1 6			
	9	11	7	Extra to neatly axed arch as before.
11	1 4			
	4½	5	6	Add soffit.
11	1 4	14	8	T-piece 4½in. soffit.
11 2	9	1	10	Fair cutting in stocks.
11	1 6			Rake out cement joints and point in
	9	12	4	mortar.
				66. Fixing slips.

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ILLUSTRATIONS.

PRINCE'S RACQUET AND TENNIS CLUB, ALBERT-GATE.—NEW HIGH SCHOOL, HARTLEPOOL.—UNION OFFICE, HAMBURGH.—TUTOR'S LODGINGS, UNIVERSITY COLLEGE, OXFORD.—HOUSE AT HAMPSTEAD.—CHIMNEYPIECE AT CLUNY.—CHURCH OF ST. ETHELBURGA, BISHOPSGATE.—NATIONAL SCHOOL, COLCHESTER.—GATES AT KNOLE PARK.—"THE BIRKHOLME," HAMPTON.

OUR LITHOGRAPHIC ILLUSTRATIONS.

PRINCE'S RACQUET AND TENNIS CLUB.

Prince's Club has been built on ground part of which was formerly the site of the Japanese Village. The present entrance leads direct from the Knightsbridge-road into a fine hall of Classic design, and called the lounge. From the lounge an ante-room is entered, Elizabethan in character, and some 45ft. square, having a finely-carved oak chimneypiece, and a panelled oak dado running round at a height of 10ft. above which is hung richly coloured tapestry. Overlooking the room is a minstrel gallery, from which its picturesque character and fine proportions may be seen to advantage, and a good view obtained of the coffered ceiling. The racquet courts have been as nearly as possible copied from the courts of the old club in Hans-place, the tennis court being modelled after that at Manchester, Mr. C. Saunders, the champion, advising on and superintending its erection. The courts are so arranged that from the racquet-court gallery play from all three courts can be seen. An exceptional feature in the club is its Turkish bath, without doubt the most elegant in London. This has been decorated by Signor Marolda and a staff of Italian artists. There are also numbers of hot and cold water baths, a Russian or vapour bath; needle, sitz, and other baths, also a most luxurious plunge-bath, lined with blue mosaic, with a finely polished brass curb. The building is lighted by electricity and ventilated on modern principles. A lease of nearly 80 years has been obtained, and the number of members is over a thousand. The club has been built by Messrs. Peto Bros., from the designs of the architect, Mr. E. H. Bourchier, A.R.I.B.A., of 32, Great George-street, S.W., the quantities being taken out by Mr. Pope, of John-street, Adelphi, and the decorations and furnishing have been directed personally by a member of the club, Mr. George Donaldson, who also designed the oak room ceiling. The electric-lighting is by the United Electric Engineering Company, under the supervision of Major General Webber, C.B. The floors of the racquet courts were laid most successfully by Claridge's Asphalte Company. Owing to an existing iron roof having two spans of 45ft. each, and one of 27ft., considerable difficulty was experienced in fitting it to the new buildings, and in all some 28 columns carrying the old roof were taken away, together with cast-iron spandrels, stilting pieces, &c., the roof then being supported on girders running from such points as were available in the new work.

THE NEW HIGH SCHOOL, HARTLEPOOL.

This building, the corner stone of which was laid on August 8th last year, has been erected from the designs of Mr. G. Gordon Hoskins, F.R.I.B.A., of Darlington, and was formally opened by the Marquis of Londonderry on September 25th. It has a frontage of about 120ft. facing the town moor and the sea, and a main entrance frontage of 50ft. in Friar-street, where the turret of about 60ft. high forms a conspicuous feature. The materials employed are red pressed bricks and terracotta, manufactured in accordance with the architect's detail drawings by Messrs. J. and W. Dunwell, of Grosmont, near Whitby, Mr. J. C. Edwards, of Ruabon, and Mr. J. Thompson, of Northwich, respectively. The whole of the masonry is from quarries near Carlisle. The roofs are covered with light green Westmoreland slates. The plan of the building is upon what is now generally known as the hall-passage system. The accommodation provided consists of a large hall 50ft. by 25ft.; four classrooms, each 21ft. 6in. by 17ft. 6in., one of which is fitted up as a science-room and laboratory; board-room, 18ft. by 17ft. 6in.; head master's room, 18ft. by 10ft.; covered playground, lavatories, hat and cap lobbies, &c. The basement contains school cleaner's store, 17ft. 6in. by 14ft.; heating chamber, 18ft. by 10ft.; and fuel chamber, 17ft. by 9ft. 3in. The large room has a large open-timbered pitch roof, not unlike that of the large hall of the Darlington Grammar School, designed by the same architect, and a panelled pitch-pine dado. The classrooms are also furnished with pitch-pine dadoes and Carlisle fossil chimney-pieces. The floors of porch, vestibule, lobbies, lavatories, &c., are laid with suitable and serviceable mosaic pavement. The whole of the sanitary arrangements are of a most satisfactory character, manufactured by Messrs. Adams and Co., of York. The contractors for the work have been as follows:—viz., excavators, drainage, brickwork, terracotta, masonry, smith, and iron-founder's work, Messrs. J. W. and M. McKenzie, Darlington; carpenter's and joiner's work, Mr. Thos. Beetham, West Hartlepool; slater's work, Mr. John Wandless, Darlington; plasterer's work, Messrs. R. M. Ormerod and Son, Carlisle; plumber's, glazier's, and gasfitter's work, Mr. Emmerson Smith, Darlington; painter's and stainer's work, Mr. J. W. Stokell, West Hartlepool. The clerk of the works was Mr. Joseph Hindmarch.

HAMBURG.

In spite of its great fire a large portion of the old city (particularly at its west, or Altona, end) consists of wooden houses with their gables and upper stories projecting over narrow streets; but at the eastern end, in the neighbourhood of Sir Gilbert Scott's Nicholas Church, there are some fine, old, substantially-built merchants' houses of the 17th or 18th centuries. Some of the best of these are to be found in the Grosse-Reichenstrasse, and we illustrate the house now numbered 31, which is at present occupied by the Union Assurance Office of London. The façade is wholly of stone, very French in character, and may have been built for a descendant of one of the many Huguenot refugees who settled in Hamburg. The arms carved over the entrance might help one to discover the position of the founder; they are, however, scarcely decipherable, but seem to bear in the field three roses, and in chief an initial, and the crest appears to be an eagle. An inscription inside the house records the name of the "Bauherr" in old German, thus:

"Das hüs stein yis
bi Peter His."

and in the courtyard on what appears to be a foundation-stone is the date 1716.—J. Tavenor Perry.

TUTOR'S LODGINGS, UNIVERSITY COLLEGE, OXFORD.

This is an illustration of a house recently erected at University College, Oxford, to provide accommodation suitable for a resident married tutor. It is situated in a retired portion of the College grounds adjoining the library, and with an independent access from Grove-place for the use of the residents. It has been economically designed, the elevations being of a quiet, simple character, executed in red brick with stone dressings. The accommodation is that usually found in a good class private house, and it proves to be a nice looking, very conveniently-arranged building. The work was intrusted to a local firm of contractors, Messrs. Wilkins and Sons, from the designs of Mr. H. Wilkinson Moore, architect, of Oxford.

HOUSE AT HAMPSTEAD.

I much prefer not giving any detailed description of illustrations of my work. The house has recently been built at Redington-road, Hampstead, and the front shown is towards the garden. —Horace Field.

CHIMNEYPIECE BY HUGUES LALLEMAND, MUSEUM DE CLUNY, PARIS.

This national and unique museum is, of course, one of the most interesting and well known sights of Paris, while the rich old mansion, finished by the great Jacques d'Amboise, in which the collection is located, is worthily famous as one of the finest specimens extant of the semi-Gothic Renaissance. The house was begun by Abbot Jehan, bastard of Bourbon; but he died in 1485, and the building was not completed till 1515. Mary, daughter of Henry VIII. of England and widow of Louis XII., lived in it, being known as La Reine Blanche, because she wore white mourning in accordance with the custom of the Queens of France. James V. of Scotland celebrated his wedding with Magdalene, daughter of Francis I., at this house in 1536, and the princes of the house of Lorraine afterwards made it their town residence. At the time of the Revolution the palace became, in some way, the property of the nation, and was falling into ruins, when M. du Sommerard, a great French antiquary, bought the property in 1833, and filled it with Mediæval treasures and works of art. In 1843, on his death, the Government purchased the collection and property for £20,000. The restoration of the house was commenced under Louis Philippe, and the renovations were continued till after 1850, while the museum itself has been continually increased till it now contains between 3,000 and 4,000 works of art, including a grand collection of ancient and mediæval carving, glass, pottery, metalwork, dresses, carriages, cabinets, furniture, ivories and gems, &c. The rooms are most artistically arranged, and even if some of them are dark as compared with modern-built museums, the objects are seen, as it were, *in situ*, and with the greatest advantage of a sympathetic setting. The collection includes some capital examples of Renaissance work, among which are two chimneypieces from a house at Chalons-sur-Marne, where the great fire of forty years ago brought about so much demolition, and led to such frightful restorations of the old architecture of the town. One of these mantelpieces we give a drawing of to-day, showing carefully its curious and singularly elaborated detail, the work of a sculptor named Hugues Lallemand (or Lallemant, as sometimes spelt) in 1562. Nothing much seems to be known about this artist so far as we have been able to gather, and he is mentioned in neither the "Dictionnaire d'Architecture," or in Leon Palustre's "La Renaissance en France," nor in Lance's "Dictionnaire des Architectes," where most of the principal French architectural sculptors are described. He evidently belonged to the school of Jean Goujon and Philibert de L'Orme. The first carved the great portals of St. Maclou at Rouen, and the latter was one of the earliest designers of florid chimneypieces, such as this now illustrated. Lallemand seems to have revelled in extravagances of design, bringing into juxtaposition the most incongruous details and subjects for his ornamentation, and yet by keeping the lines of his composition severe in general treatment, and well within the rectangular forms of the constructional outlines, he contrived to secure dignity and appropriateness, as well as a florid character in his work. The central cartouche is said to contain for its subect "Christ of the Fountain," the Virgin and Child being represented in the middle of the sculpture, with children grouped curiously in front of buildings to the back of the representation. The height of the chimneypiece is about 10ft. 6in., and nearly 10ft. wide.

ST. ETHELBURGA'S, BISHOPSGATE.

In carrying out the restorations and additions here shown, the present clerestory is to be cleared away, and rebuilt in the interior with bands of pale yellow alabaster and pale red brick, on the exterior with yellow stock brick, polished red Devonshire marble being used for jambs and arch of new east and clerestory windows. The tracery will be of Portland stone in all cases. The north wall will be covered with mosaic, representing in the frieze historical subjects connected with the diocese, below various saints panelled below this with red Devonshire, with divisions of rose coloured and green Killeg Park marble; also from Devonshire in the lowest

portion. All strings are to be of polished Purbeck. All ancient jambs, pillars, and arches will be painted pale greenish-white. The floors are black Ashford and polished red Aberdeen granite slabs, laid diagonally. The surbase of all screens is of Mexican onyx. Venetian mosaic copies of paintings by the old masters will fill the panels of the reredos, with saints below. The reredos (to be gilded), rood-screen, sedilia, stalls, pulpit, and canopy, roof and seating, together with altar, will be of carved and framed oak, darkly fumed with ammonia. No portion of the ancient work will be touched. The vestries are entirely new, together with heating chamber beneath.—H. D. W.

WROUGHT-IRON GATES, KNOLE PARK, KENT.

THE subject of this drawing is situate in the south-east boundary-wall inclosing the grounds of Knole House. At this opening a pretty glimpse of the south-east front may be obtained down the avenue, at the entrance to which the gates stand. The writer has been unable to ascertain the exact date at which this ironwork may have been erected; but believes it to be of early 18th-century date, probably of the time of the first Duke of Dorset, who succeeded to Knole 1706, and died 1765.

W. M. Ashmore.

"THE BIRKHOLME," HAMPTON.

"THE BIRKHOLME," the summer residence of Alderman Sir H. E. Knight, stands upon the banks of the Thames at Stam Hill Park, Hampton, and commands a beautiful view of the river and its surroundings. A large boat-house and good stabling are provided. The materials are Bracknell brick and hanging tiles, with Broseley tiles for the roof, and York stone dressings. The house internally is replete with all modern requirements.

CHIPS.

A large group of board schools is approaching completion at Lynnfield, West Hartlepool. Mr. G. Gordon Hoskins, of Darlington, is the architect.

A committee of the Darwen Town Council have unanimously decided to purchase the Blackburn works of water supply for £60,000, which is a deduction of £40,000 from the original price asked by the Blackburn Corporation for the Pickup Bank and Daisy Green reservoirs. The drainage area of the watershed is 537 acres, and the total capacity of both reservoirs is 43,550,000 gallons. The average daily flow is estimated at 1,000,000 gallons, and there is no compensation water to be delivered. About £5,000 will be required to convey the water to Darwen.

Works of extension and improvement have just been carried out at the Queen's Hospital, Birmingham, at an outlay of £5,500, including new furniture. The completed works, for which Mr. E. Harper was the architect, were inspected by the subscribers to the special fund on Monday.

Major-General C. P. Carey, C.E., an inspector of the Local Government Board, held an inquiry at the Southport Town Hall, on Monday, into the application of the corporation to borrow £2,900 for an approach bridge from Hart-street and the surrounding new district to Ash-street and St. Luke's-road railway-bridge, and £1,300 for increasing the abattoirs at Blowick.

During the laying of the foundations of the new infectious diseases hospital at Carnarvon, the workmen have come across a portion of an old Roman road, in a good state of preservation, and believed to be that connecting Caerhun, the Roman Canonium, with Segontium, the Roman Carnarvon.

A United Free Methodist chapel and school were opened on Saturday at Gomersal, near Leeds. The buildings are of stone, with pitch-pine fittings, and consist of chapel seated for 400 persons, with schools for 250 children in the basement. Mr. Burrows, of Birstall, was the architect, and the outlay has been £1,500.

The Downall memorial pulpit in All Saints' Church, Okehampton, was unveiled on Sunday. It was designed by Mr. John Hayward, of Exeter, from whose plans the church was rebuilt in 1842-3, after destruction by fire, and has been constructed by Mr. by Harry Hems, also of Exeter. It is of English oak, and is octagonal on plan.

The parish church of Nymet Rowland, two miles from Lapford Station, Devon, was reopened on Wednesday week after the restoration of the nave, north aisle, and porch, including removal of plaster ceilings from the roofs and reseating. Mr. W. Dart, of Crediton, was the builder.

THE ARCHITECTURAL ASSOCIATION CONVERSAZIONE.

THE opening of the forty-eighth session of the Architectural Association was commemorated on Friday evening by a conversazione given at the Town Hall, Westminster, by the new President, Mr. Leonard A. S. Stokes, and the committee. The band of the 20th Middlesex (the Artists') Rifle Volunteers, conducted by Mr. W. H. Ackerman, played selections of music in the large hall, and a concert took place in the council-chamber, Miss Ethel Winn, and Messrs. John Elwin, Mr. J. Gawthrop, Mr. H. Schartan, and Herr Polanaski (violinist), being the performers, and at frequent intervals exhibitions and explanations of Edison's phonograph were given in the council-chamber. As in previous years, the suite of rooms on the first floor were devoted to art, the area of the large hall being given up to trade displays. The former included the works done in the various classes during the session, the very complete series of photographs illustrating the Marshland Excursion, taken by Mr. J. L. Robinson, A.R.H.A., and a large collection of water-colour sketches by the President (the throne in Monreale Cathedral and the pulpit at Salerno), W. H. Atkin Berry, D. J. Blow, H. O. Cresswell, J. Louis Florence, Francis Hooper, W. Millard, Francis Miller, Roland W. Paul, E. N. Selby, and R. Phené Spiers, F.S.A. In the great hall were hung examples of new designs in wall-papers, shown by Messrs. Jeffrey and Co., of Essex-street; hand-printed papers by Messrs. Thomas Wardle and Co., of Leek; gilded leather papers of Japanese character, by Rottmann, Strome, and Co., and also among other exhibits some admirable furniture by Messrs. Jenks and Wood, of Berners-street.

The prize list of awards for work done in the past session in the various classes was read by the President, as follows:—

Architectural Association Travelling Studentship.—A. E. Bartlett.
Architectural Association Silver Medal.—E. A. Hill.
Essay Prize.—C. H. Strange; hon. mention, G. W. Sadler.
Measured Drawings.—1st, Not awarded; 2nd, A. W. Cleaver.
Cates Prize.—A. C. Walker.
Sketchbook Title-page.—Not awarded.
Elementary Class of Design. Section I.—1st, J. R. Stark; 2nd, R. Enoch.
Elementary Class of Design. Section II.—1st, J. S. Stewart; 2nd, H. A. Saul.
Elementary Class of Construction.—1st, H. J. Leaning; 2nd, A. T. Walmsley.
Elementary Class of Colour Decoration.—1st, H. Druery; 2nd, L. Sargent. Class Prize, J. D. Scott.
Class of Design.—1st, E. F. Seaman; 2nd, A. W. Jarvis.
Colour Decoration Class.—1st, V. T. Jones; Time Sketches, V. T. Jones.
Class of Construction.—1st, F. R. Taylor; 2nd, F. H. Greenaway; Hon. Mention, A. O. Breeds.
Quantity Surveying Class.—1st, W. J. Wilsdon; 2nd, H. L. Patterson.
Lectures on History of Architecture.—1st, E. Carless; 2nd, M. Garbutt; 3rd, A. T. Walmsley. Hon. Mention, P. H. Adams, Johnson, and Taylor.
Lectures on Construction.—1st, C. H. Strange; 2nd, J. Murray; 3rd, T. Jenner and J. W. Wyles, æq.

COMPETITIONS.

Berlin.—In the competition for the best design of a national monument to the memory of the late Emperor William I., the jury has now issued its award, which grants two first prizes and four second out of a total of 114 competitors. The competition was confined to the sculptors and architects of Germany, and the latter have borne away the palm, the two first prizes being awarded to plans in which architecture is the predominating element. It does not follow, though it is probable, that the first premiated design will be the one ultimately selected. The most conspicuous of these, which proves to be the work of the architects who are building the new Imperial House of Parliament on the Konigsplatz, Messrs. Rettig and Pfann, is that of a huge structure, half-temple, half-cathedral, surmounted by a victory-topped dome, which would be made into a kind of Pantheon for the unifiers of modern Germany. Under the dome, at the top of a broad flight of steps, there would stand a statue of the Emperor, flanked on either side by statues of his great generals, while the pile would also contain a hall or Valhalla of German Sovereigns. The designers of this Pantheon propose to build it on the site now occupied by the theatre and summer garden on the Königsplatz, exactly opposite the new Reichstag building, with the victory column between and the offices of the grand General Staff in view, and the execution of this scheme would make the Königsplatz a square second to few or none in Europe. The other first prize was conferred on another Berlin architect, Herr Schmitz. His design is a monument to be erected at a *carrefour* in the Thiergarten. The four second prizes were awarded to purely sculptural models.

Birmingham Board Schools.—The Sites and Buildings Committee of the Birmingham School Board recently invited plans for the new schools to be built in Banbury-street from six architects, excluding the architects of the board and the architects of the two schools last erected. They recommended the board to adopt the design marked "Apropos." The recommendation was adopted, and the chairman, opening the sealed letter, announced that the successful competitor was Mr. W. Hale, of Colmore-row, Birmingham.

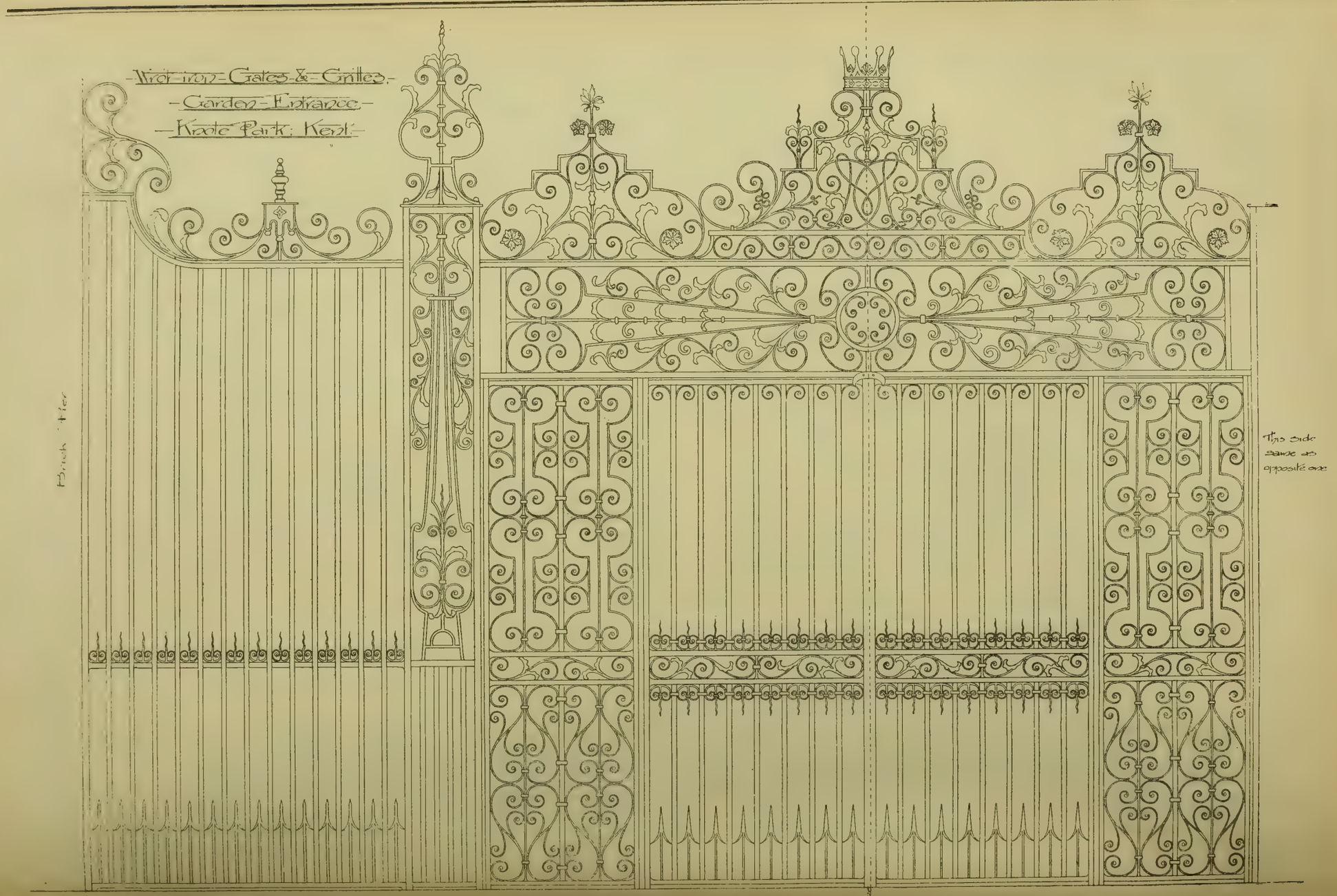
Bournemouth.—The competition which has been held lately for a new Baptist chapel in this town has resulted in the selection of Mr. James Cubitt's design, and Messrs. Lawson and Donkin were placed second. The building will cost between £5,000 and 6,000.

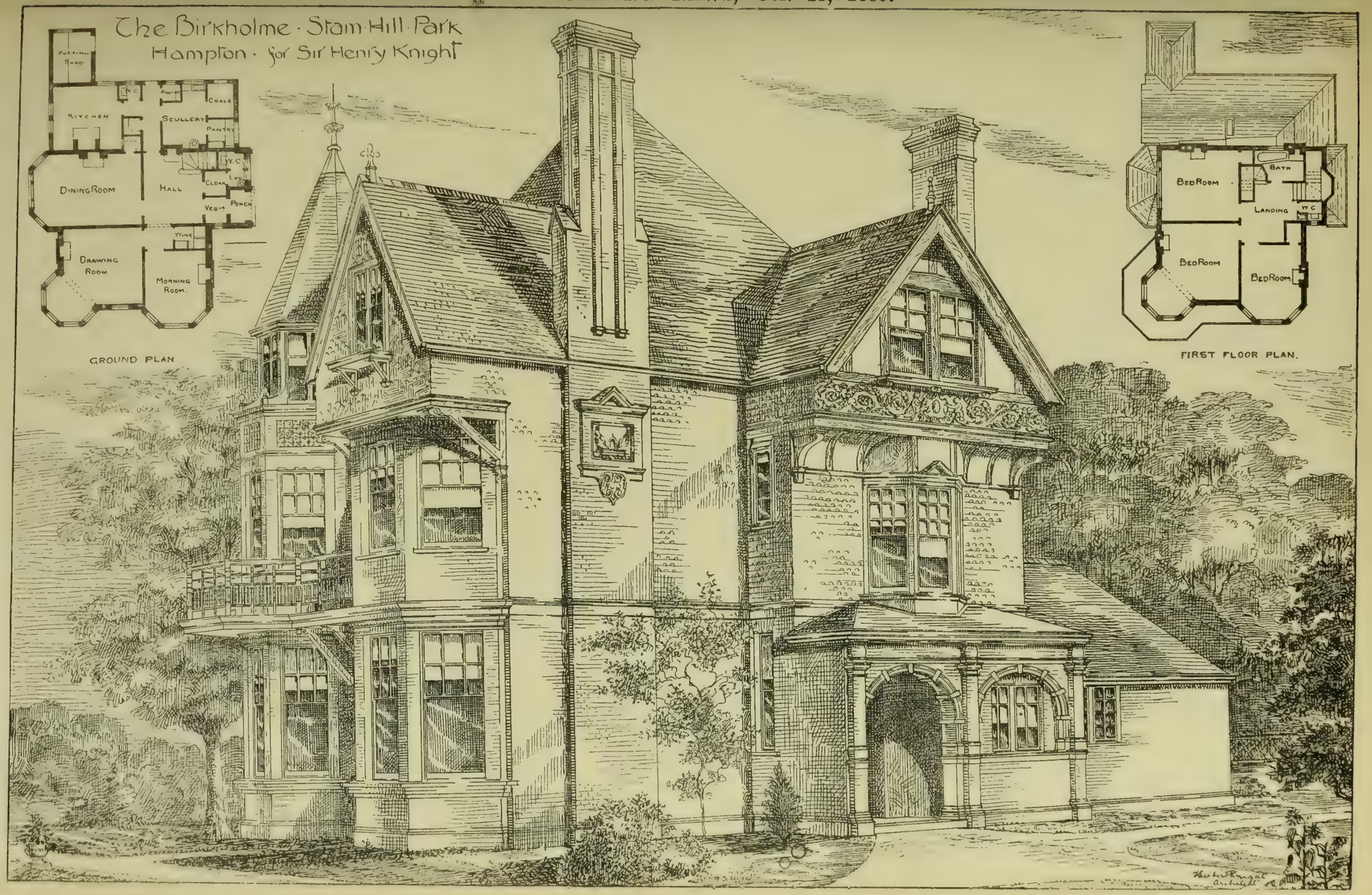
Broughton, Salford.—The Salford Council have confirmed a resolution of the Baths Committee, selecting the plans of Messrs. Mangnall and Littlewoods, of Brown-street, Manchester, for the new baths at Broughton. Seven sets of designs were sent in, each under motto, and to those marked "Leander" they have awarded the first position, and intend them to be carried out. The second premium of £30 was given to Messrs. Darbyshire and Smith, whose motto was "Greater Salford," and the third premium of £20 goes to Messrs. Booth and Chadwick, who adopted the motto of "Simplex." The other four designs were by Messrs. Hewitt, Messrs. Beaumont, Messrs. Smith, Willoughby, and Woodhouse, and Mr. T. Cook. The selected plans will be erected in Great Clowes-street at a cost of £8,000. There are two large swimming-baths for first and second class, the larger being 75ft. by 28ft., the other 60ft. by 25ft., and there are thirty slipper baths for first and second class, with vapour and shower baths, also a residence for the superintendent, laundry, committee-room, &c. The interior of the baths will have glazed brick dado, all the joiner work being finished in pitch pine. In the exterior terracotta is being largely used.

Wednesbury.—The arrangements for the building of the Art Gallery buildings at Wednesbury are now taking definite form, and the collecting of the funds is progressing satisfactorily, the contributions now amounting to nearly £1,500, in addition to the £2,000 left by the late Mrs. Richards. In an open competition by leading architects of the district, the design and plans marked "Terracotta" were accepted conditionally on their being approved by the trustees under Mrs. Richards's will, and were found to be the work of Messrs. Wood and Kendrick, of West Bromwich. That approval has now been given by the trustees. Instructions will forthwith be given to the architects to prepare specifications. The foundation-stones will probably be laid in the early spring of next year, so that the building may be opened in the following autumn.

The chief window in the north transept of the parish church of Ashford, Kent, has been filled with stained glass as a memorial to the late Robert Furley. It is of four lights, and is the work of Mr. C. E. Kempe, of London. In the upper portion are four figures, representing St. Augustine, St. Theodore, St. Anselm, and St. Alphege (Archbishops of Canterbury). The lower part of the window contains representations of the following subjects:—Gregory seeing the English slaves in the Forum at Rome; the landing of St. Augustine and his missionaries in Kent; St. Augustine and his missioners before King Ethelbert and Queen Ethelbertha; the baptism of Queen Ethelbertha; and the consecration of St. Augustine as first Archbishop of Canterbury.

The organ in St. George's Church, Botolph-lane, E.C., was reopened on Sunday after considerable alterations and additions. The organ was originally built in 1722 by Abraham Jordan, the inventor of the swell organ. It has been pronounced to be "one of the best-preserved specimens of one of the best builders of the last century." The rebuilding has been carried out by Messrs. Speechly, of Hoxton.


Wrot-iron Gates & Grilles
Garden Entrance
Knole Park, Kent.
Brick Pier
This side same as opposite one
Scale of feet
Part Elevation showing Gates and one side Grille


The Birkholme · Stam Hill Park
Hampton · for Sir Henry Knight
Potting Shed
Kitchen
Scullery
Pantry
Coals
Dining Room
Hall
W.C.
Cloak
Porch
Vest.
Wine
Drawing Room
Morning Room
GROUND PLAN
Bed Room
Bath
Landing
W.C.
Bed Room
Bed Room
FIRST FLOOR PLAN.

WAYSIDE NOTES.

HOW the soul of the architect is vexed by restorations! On matters that personally inconvenience him and directly affect his interests, he preserves silence unutterable; but when it becomes a question of "restoring" this or that old building, he takes up his most trenchant pen and writes manfully in the columns of professional journals. As you stated in your leader last week, your own pages for months back testify to the hearty and earnest enthusiasm shown in this matter. And, to the true architect, nothing is more galling than the wanton destruction of old work. My own sympathies are always with those who raise the alarm or assist the agitation against destructive restoration. The only matter for regret in connection with this subject is that we do not seem to get any "for'arder" in the way of a clear and mutual understanding as to what constitutes justifiable restoration. Upon one point, however, we are all-decided, and that is as to the sinfulness of that species of restoration known as "Grimthorpeism." This term is the issue born of much controversy, and, rightly understood, implies the pulling down of old work and the setting up of new after particular individual fancies.

It seems to me that in discussing questions of restoration, it is important to bear in mind that there are various grades of restoration. Restorations may be (1) Reparation, pure and simple—viz., effecting such works as will render the building sound and inhabitable; (2) Restoration proper—viz., making good the old work where defaced by time, in addition to reparation; (3) Rebuilding—viz., employing new stone, while working to old design, and carrying the work so far even as rebuilding the whole edifice; (4) Substitution and alteration (Grimthorpeism)—viz., pulling down old work and rebuilding after one's own sweet will; and (5) Imaginative restoration (*literal* restoration) as in restoring back to a certain epoch, or restoring a whole building from a few fragments, or from certain hypothetical data. To formulate things:—

Restoration = { 1. Reparation; 2. Restoration proper; 3. Rebuilding; 4. Substitution and alteration; 5. Imaginative restoration.

It would seem to me of moment that this formula should be kept before one in speaking of restoration. Many there are who, if asked to define what they meant by *restoration*, would find they had no clear idea on the subject.

The first kind of restoration named above takes little or no notice of the condition of the ancient handiwork so long as the building is safe, the roofs watertight, and the walls firm and strong. It is a restoration rather of the *building* than of its *architecture*. I include it in the category because buildings so treated are constantly said to have been *restored*. Such restorations leave the whole edifice a thing of beauty and joy for a season. The second class of restoration involves the careful introduction of pieces of new stone, moulded, &c., as may be necessary, into the body of the old architecture. It hesitates long to completely rebuild a window, door, turret, or even the smallest ancient feature, and if such be absolutely necessary, it strives, still, to include the few first fragments that, peradventure, may remain. The latest example of work of this nature I saw last week at an old church off the College Green, at Bristol, which, from all I could gather on the spot, is being restored under Mr. Arthur Street's supervision. The building is being most carefully overhauled, new stones being sparingly introduced in the masonry, and small pieces being let into the moulded portions, mullions, &c, with the utmost nicety and reverent regard for the old work. The third class of restoration is thorough—harshly thorough. It sweeps away ruthlessly, but yet with all due regard to the old design. Though disrespectful of ancient handiwork, it reverences the original design. Its ultimate result is sleek and clean, and repellent to the eye of the artist. It is as the marble statue to the living being. But it is nevertheless a class of restoration that is often absolutely necessary if the building is to be prevented from falling into a ruinous condition. It is therefore justifiable, even if it saddens one at times to see, as at Worcester, extensive façades rendered permanently sleek and uninviting. Of the fourth class of restoration nothing need be said, as it is *appreciated* to the full by all architects. It ought not to be spoken of in the same breath as other kinds of restoration. The last type, "imaginative restoration"—e.g., the restoration of buildings adjoining Westminster Hall—is nearer fulfilling the literal meaning of the word *restoration* than any other of the classes given above. It should demand, however, a certain amount of old work to guide the restorer, for to restore a work of architecture would literally mean to reproduce the whole from a few remaining parts.

I notice that there is some talk of a bishop's see being founded at Birmingham; in which case there should be—not necessarily, I believe—a cathedral wanted. To the proposal to found the new see the Archbishop of Canterbury has given his warm assent, and there seems every possibility of the scheme being successfully carried through. If a competition for a new minster comes along, it is to be presumed that the cathedral department in many architects' offices will be busy and working full time. We could do with a good competition of this nature, having only had the Liverpool one of late years, and that turning out a thorough *fiasco*. Without a few cathedral competitions there is really no vent for that pent-up architectdral genius which is thrown away on such prosaic matters as town-hall designing and the like.

It is to be hoped that Professor Roger Smith's lecture on "Sir Christopher Wren and his Architecture" may promote a more widely extended appreciation of that great architect's skill. Of late some of us seem to have been about dead to any sense of the beautiful in Wren's designs, for never was there such a precipitous rush for arranging schemes for the demolition of many of his less pretentious masterpieces as the past few months have witnessed. Proposals to pull down a number of City churches whereof Sir Christopher was the architect, have been made with astonishing frequency, each of which I have noticed as they have become open secrets. The fact is that Wren is little known and appreciated, even by architects, excepting as the designer of St. Paul's, Bow Church, and Greenwich Hospital. Of the lesser, though, at times, no less beautiful, buildings, he has designed, as, for example, the large array of City churches, little appears to be known, it being inconvenient to gain access to some on the ordinary week-day. A systematic study of these interiors, however, throws much light upon the nature of Wren's genius, and serves very greatly to increase our admiration for his capabilities as a designer. Of course, one doesn't pretend to find much that is wonderful in his attempts after the Gothic manner. Nevertheless, I have long had a private theory that, had Sir Christopher flourished in earlier days, he would have produced specimens of Mediæval architecture of the highest order. I venture to advance publicly this old-standing private opinion, on the grounds that there is a something about the mere *jointing of his masonry* that bespeaks suppressed Gothic tendencies. It is always studied, highly constructional, and candidly exhibited. I have noticed this in very many of his church towers, and it has always given me the impression—difficult, perhaps, to convey to others—that Wren was at heart a Goth, though brought up in a Classic school.

Professor Thorold Rogers must either be suffering from the liver, or some domestic calamity has befallen him. Possibly one of the chimneys in his house "smokes," or the cook has given notice because the plan of the building omitted to study her (or his) every convenience. A friend sends me a cutting from the *Leeds Mercury*, wherefrom I learn that the good professor, on the occasion of his addressing a meeting of the governors and those interested in the welfare of the Salt Schools at Shipley, has railed, in good set terms, upon individuals in our humble walk of life. Alluding to Kirkstall and other Yorkshire abbeys, the Professor is reported to have said, "Nobody knew who built them, and that was because they were built by working men. Working men formed the plans, and carried out the details. In those days the efficiency of labour was so low that people could not afford architects, and in his University the whole of the plans of the finest college in Oxford were supplied by a man who probably only received £1 per week, and who built fifty times better than *the humbug who called himself an architect*, and who got fifty times as much." Have we here a rising competitor with Lord Grimthorpe, or has the professor suffered some trifling inconvenience, such as one of those detailed above, from the gross neglect of some member of the architectural profession?

Whether or no Professor Thorold Rogers is ready to fall a-weeping into the arms of Lord Grimthorpe matters little; but it seems a pity that a Professor of History should go out of his way to drag into his discourse a subject having nothing to do with his theme, and dilate thereon in a manner calculated to deceive his hearers; it seems a pity that a Professor of Education should have neglected his own education so lamentably as to stuff his audience with exploded popular theories and notions like those which hold that all old buildings were designed by the labourers on the spur of the moment. It is to be regretted that the professor should not have gone more deeply into the matter of the origin, founding, and designing of some of the beautiful Yorkshire abbeys before expressing convictions as to the impossibility of knowing who designed them. If Professor Thorold Rogers had educated himself a little more fully in this direction, would he not have found that the case was not so hopeless as he imagined, and that if he himself was so ignorant as not to know who built the abbeys in question, others could supply him with the information if he returned to "his university" for a season?

In the matter of the proper position of the mason's yard, I do not suppose you will be inclined to open your columns to a very long discussion on the subject, unless the advocates of quarry-worked stones come forward with much more powerful arguments than those advanced by "A Quarry Owner." The quarryman's business is to quarry stone *en bloc;* the mason's business is to work the blocks thus procured into required shapes; and the architect's business is to see that "Stonio" and his brothers work the stone properly, and this, it seems clearly evident, he cannot do when the stones and those occupied in working them are distant a hundred miles or more from his head-quarters and the building he is engaged in erecting.

GOTH.

CHIPS.

Out of the fifty-two candidates, Dr. Cameron, medical officer of health for Huddersfield, has been appointed Medical Officer of Health for Leeds, at a salary of £700 a year and allowances.

During the past week there have been erected in the east end of the parish church of Ladhope, near Galashiels, two stained-glass memorial windows. The windows are lancet-shaped, and the work has been executed by Messrs. Butler, Heaton, and Bayne, of Covent Garden, London. The subjects represented are, respectively, "Christ Teaching in the Synagogue," and "Nathaniel being brought to Christ by the Apostle Philip."

The town council of Longton discussed last week whether the competition for a pavilion to be erected in the public park should be restricted to local architects or thrown open to the world. Twelve members voted for and twelve against making it open, whereupon the mayor gave his casting vote in favour of a restricted competition.

The foundation-stone of a permanent church to be built at East-the-Water, Bideford, was laid last week. The church will consist of nave, chancel, porch, and tower and spire, and will be Early English in style; the walls will be of local stone, with Bath stone dressings, and it will be seated with chairs for 350 persons. Mr. R. T. Hookway, of Bideford, is the architect, and Mr. T. H. Glover, of Abbotsham, the contractor. The cost will be £1,000.

Memorial stones of new Unitarian schools were laid at Gee Cross, near Manchester, on Saturday. They will adjoin the existing schools at that place, will be like them Gothic in style, and will accommodate a similar number (350) of children. Messrs. Worthington and Elgood, of Manchester, are the architects, and the outlay will be about £3,000.

At a general assembly of the Royal Society of British Artists, held on Monday evening, Mr. J. Herbert Snell and Mr. J. M. Macintosh were elected members.

In the tower of St. Mary Magdalene Church, Worcester, a large clock has been erected by Messrs. J. B. Joyce and Co., of Whitchurch, showing time upon three dials and striking the hours.

THE LONDON SCHOOL BOARD CONTRACTS.

THE subjoined memorial from the London builders to the members of the London School Board was presented by Mr. A. G. Cook and Mr. E. Barnes yesterday (Thursday) afternoon, and was referred to the Works Committee for consideration and report.

"To the Chairman and Members of the London School Board.

"The respectful memorial of us, the undersigned ratepayers and tradesmen, carrying on their respective businesses in London, sheweth:—

"1.—That between the dates of December 17, 1885, and the 21st February, 1889, all the work necessary to general repairing and painting the London Board Schools were carried out in accordance with the terms of a resolution passed by your honourable Board. The wording of such resolution is as follows:—

"'That at least ten days' public notice shall be given, by advertisement, inviting tenders for all further contracts for £100 and upwards, and the Board shall require sufficient security for the due performance of such contract.'

"2.—That upon the 21st of February, 1889, the following resolution was passed by your honourable Board:—

"'That, as far as regards tenders for the erection of new schools, or enlargement of schools, and also general repairs to or painting of schools, the following resolution of the Board of December 17, 1885, be rescinded.'

"3.—That the effect of your honourable Board in passing this resolution to rescind that of December 17 has been that to seven builders only have been given all the repairs to the schools and furniture, and painting of the schools; and to 12 builders, including some of the seven herein alluded to, as we are informed, all the new buildings and enlargements.

"4.—Your memorialists respectfully urge that the establishment by you of such a system of close contracting as that by which, in the first instance, to seven firms only, and in the second instance to 12 firms only, inclusive, would be given the whole of the work necessary to the schools is inimical to their interests as ratepayers and tradesmen, and they ask that, notwithstanding the resolution passed by your honourable Board, 21st February, 1889, you will immediately adopt some plan that, in its effect, will secure to your memorialists opportunities for them to again tender, from time to time, for all works, in accordance with the resolution of the Board, passed on the 17th of December, 1885.

"Many of your memorialists have been for a number of years working for your Board (they were recommended by honourable members) to carry out at the schools work that could not be tendered for; and being without knowledge of complaint as to their efficiency, consider that after so many years' connection with your Board in carrying into completion the work intrusted to them, the mere fact of their being now so publicly excluded by you implies a stigma upon their characters.

"And your memorialists respectfully request you will, at the earliest possible date, receive a deputation, in order that they may lay before you their objections to their being excluded from executing work for your honourable Board.

"Trusting that our requests may be granted, we are, ladies and gentlemen, yours respectfully,

"Lawrence Stevens, L.C.C., Chairman."

SOCIETY OF ENGINEERS.

AT a meeting of the Society of Engineers, held at the Town Hall, Westminster, on Monday evening, October 7th, Mr. Hy. Adams, Vice-President, in the chair, a paper was read by Mr. J. H. Cunningham, A.Am.Soc.C.E., on "Pin-Connected *v.* Riveted Bridges."

The author stated that towards the end of the year 1884 he had made two designs for the superstructure of a bridge to carry a railway across the Mary River in Queensland. There were to be three spans, the centre one being 120ft. long, and those at the sides each 80ft. in length. In the one design pin-connected trusses having long panels, such as are now common in America, were adopted, and in the other the trusses were of the lattice type, and all their joints were riveted. The pin-connected design was prepared as an alternative in order to ascertain whether a structure of that kind would be cheaper than the riveted one. On carefully comparing them, it was found that the pin-connected trusses were 19 per cent. lighter than the riveted ones, and that in erecting the work in the field, 5½ rivets would have to be driven in the riveted structure for every one required in the other. But these advantages were partly counterbalanced by the greater weight of the floor in the pin-connected bridge, and the riveted one was selected and built. The author then proceeded to apply the facts above noted to bridges in general. He thought they indicated that pin-connected bridges would be more economical and more easily erected than riveted ones, and American experience fully confirmed these conclusions. In the States the economy of every type of bridge had been thoroughly tested by rival builders, and they had found that the best results were obtained by using long panels with pin-joints. Bridges of that kind were erected very quickly, spans of 400ft. to 500ft. being put together in from four to six days, and 250ft. spans in two days. In concluding, the author drew attention to the importance of adopting improvements in bridge building. English engineers were fully alive to this, and he would merely suggest that progress was more likely to be made by greater care in designing, and more use of machine tools in constructing, than by the invention of new types of trusses. He thought that those who tried to effect improvements on these lines would find their work simplified by using long panels and pin-joints.

MILTON CHURCH, NEAR SITTINGBOURNE.

A FEW months ago attention was called to the proposed restoration of this building in the columns of the "B. N." As the works are now drawing to conclusion, a notice of what has been accomplished may be interesting. The general outline of the building is thoroughly Kentish, of unusual size, and has grown out of a Saxon church, the oldest walls being composed of Roman tile, tufa, flints, beach stones, and small quantities of a coarse oolite, which is found in all the other Roman stations in the county. The edifice externally has remained unaltered since the 15th century, when the whole of the northern windows were converted from Romanesque character to four-light, square-headed Perpendicular, a south aisle and chapel having been added in the previous century, but so arranged as to include an end wall of an old transept. The interior had undergone a refitting in the worst taste at no distant period, leaving in the way of woodwork merely some well-worked linen panels for the reading-desk, all the screens having been entirely removed. A general clearance of the interior was first effected, and the whole floor, with the exception of the pavement in the passages, covered with Portland cement concrete. The ceilings, which were rotten, were then removed, showing the 14th-century roofs; that over the nave is very fine, having the struts crossed in the saltire fashion over the collar. In consequence of the smallness of the funds, this has had to be covered in again; but the venerable appearance of the high roof externally has thus not been disturbed. In the course of the 15th century, in order to display a grand rood-loft, the original chancel arches were taken down, and square piers of débris masonry built in place. At a subsequent period an ill-constructed brick arch was thrown across the nave, which seemed never to have had its centres removed; any treatment short of removal *en bloc* was quite out of the question, and, as well, the northern pier in the external wall was entirely cut out, and has been rebuilt exactly as it was, avoiding, of course, the declination of the northern wall, caused by the presence of the thrust of the brick arch. In place of any arch, a very substantial roof-principal, framed in oak, on the hammer-beam system, is being constructed and ornamented, which will tie the whole building together, and be a great ornament in place of a rough horizontal beam supporting props to the arches.

Before the alterations to the arches two small oratories existed on either side, and were lighted by low side windows of Flowing Decorated character. Both these have been uncovered; the southern has a small piscina in the sill, and the jamb is rebated back to allow of the usual wooden shutter, one of the hinges of which is also seen. On this side of the building the visitor must not confound a restored (?) window with the present works; and to leave no doubt when the bastard example was introduced, full-size letters below the sill were inserted at the time of its introduction. All stonework requiring renewal has been done *in situ* in Kentish rag. The 14th and 15th century traceried windows are thus left unimpaired. The drainage of the churchyard has been thoroughly attended to. One ancient canopy of the old stained glass has been carefully re-leaded; all the rest was ruthlessly cast away at the beginning of this century, the remains being constantly dug up, but the surface of the glass falls off after exposure to the air.

The western portal of the tower is well designed; a model of it is seen in the Crystal Palace, very ridiculously tacked on to a Romanesque arch from Ely Cathedral. The grand scale of everything cannot fail to strike everyone, as well as what remains of tombs, brasses, and indications of the earlier church.

The architect employed is Mr. W. L. Grant, of Sittingbourne, Mr. Beaumont being the builder. With the exception of the brick arch referred to, nothing has been altered within the building. The pews were not more than fifty years old, and were inconvenient in form and ill-arranged; suitable benches will be provided, which will render available the whole of the nave and south aisle for a large congregation. The chancel was restored by the Ecclesiastical Commissioners some years ago. The Norwood or south chancel, which is a very fine apartment, is also being cleaned and otherwise repaired. The church forms a striking object on the left after leaving Sittingbourne Station (L.C.D.) as the train proceeds towards Dover. Since writing this notice the voussoirs of a late 13th-century window have been uncovered on the inside of the thick Norman portion of the south aisle wall. This seems to have been closed when a passage in the wall up to the rood-loft was actually hollowed out in its thickness. At the same time a flat-headed Perpendicular window was constructed lower down and further west; this again was knocked out not many years back for the sham Gothic before referred to. Unfortunately, the funds are not sufficient to restore the proper arrangement at the present time, which would obviously be a reproduction of the high and former window.

BOOKS RECEIVED.

Journal of the Royal Historical and Archæological Association of Ireland (London: Williams and Norgate; and Dublin: Hodges, Figgis, and Co.) The quarterly issue of this publication contains among other articles one by Mr. P. J. Lynch, architect, on "Kilelton Church, Co. Kerry," a small and little-known Early oratory, in plan almost identical with Temple Gael, and measuring internally 16ft. by 10ft. 6in. The low walls are 3ft. 6in. thick, built without mortar, and have been covered in by a boat-shaped roof. A plan, details, and section illustrate the church, which also forms the subject of a sketch accompanying Miss Mary Hickson's "Notes on Kerry Topography," in the same journal.——*Movements of Sewer Air*, by W. Santo Crimp, A.M.Inst.C.E., is a reprint from the *Transactions* of the Institution of Civil Engineers of the paper recently read before that body by Mr. Crimp, the surveyor to the Wimbledon local board, of a series of experiments on the movements of sewer air in his district. These brought forth the unexpected results that the movements of sewer gases were not due to changes in temperature, except to a very slight extent, but were almost entirely dependent on the direction and force of the prevalent wind impinging on the ventilator outlets, the currents being sometimes uphill and sometimes downhill. Mr. Crimp believes that while the influx of hot liquids into sewers probably produces some movement of the air therein, the effect is local rather than general.——The 13th *Annual Report* of the London Working Men's College shows that this useful institution is not and cannot be made self-supporting; about 800 students are being educated at a cost to themselves of about 17s. per head, about 35 per cent. of these students being workmen in skilled trades, an equal percentage being described as "clerks, &c.," while draughtsmen number barely 2 per cent.——*Ipswich, Past and Present* (Ipswich: W. Vick). Parts X. and XI. of these excellent plantinotype reproductions of scenery and buildings at Ipswich are just published, and are fully equal to the earlier numbers. The illustrations leave little to be desired as to choice of subjects and get up, and are inexpensive. Those just to hand include the Neptune Inn in Fore-street, a gabled plaster-fronted 17th-century house, with bold carvings and oriels, pretty familiar from sketches; St. Stephen's and Dial-lanes, showing some other examples of old domestic work, the flank of the well-known Ancient House, and the unrestored tower of St. Lawrence's Church; the plaster and tiled houses at the corner of the Butter Market and Queen-street, now removed to make way for a stone-fronted insurance office; a view on the Gipping, when that stream is partly frozen over; the new Post Office—an excellent example of Italian Renaissance, erected from Mr. John Johnson's designs in 1881; the remains of the old Monastery; and old houses, displaying a good specimen of carved angle post, at the corner of Silent-street.——*The Parish Church of St. Mary, Whaplode*, by W. E. Foster, F.S.A. (London: Elliot Stock).—This monograph on the large and neglected

church at Whaplode, one of the glories of the Fens, takes the form of a cloth-bound octavo volume of 120 pages, illustrated by a plan, perspective, and details. The church contains work of every period, from Early Norman to Eighteenth Century, and has suffered much from churchwardens' alterations; but is about to be restored, in accordance with a report by Mr. J. L. Pearson, R.A. Mr. Foster's notes are very complete, and evidence painstaking research and thorough mastery of the subject.——A batch of half a dozen little books intended as guides to students preparing for the May Examinations of the Science and Art Department have been forwarded by Messrs. Chapman and Hall, Limited, the agents to the department; they are: *Solutions to Questions Set in Building Construction*, 1881 to 1886, a most useful little book, by Professor Henry Adams, M.I.C.E., M.S.A., &c., illustrated by diagrams inserted in a pocket at the end—it is published at 1s. 6d.; *Hygiene*, a series of hints and notes, by Dr. J. H. E. Brock, containing solutions to the questions set in 1884-5-6; *Animal Physiology*, also by Dr. Brock; *Principles of Agriculture*, by Henry J. Webb, B.Sc., principal of the Agricultural College at Aspatria, Carlisle; *Magnetism and Electricity*, by W. Hibbert, lecturer on those subjects at the Polytechnic Institute, Regent-street; and *Elementary Physiographic Astronomy*, by John Mills, of the Normal School of Science.——We have also received from Messrs. Wyman five books just issued in their Technical Series—viz., the *Practical Telegraphist*, by William Lynd, a second edition so far rewritten and enlarged to meet new requirements as to be practically a new book; *Glass Painting* and *Wood Carving*, both by Fred Miller; a fifth edition of *Workshop Management*, by Frederic Smith; and the *Youth's Business Guide*, by "Experientia."

THE HISTORY AND PRINCIPLES OF SANITATION.

THE session of the Sanitary Institute of Great Britain was opened on Tuesday night at the Parkes Museum, when Sir Edwin Chadwick, vice-president, read an address on "The General History and Principles of Sanitation." Sir Douglas Galton presided. Sir E. Chadwick began by referring to the earliest-known traces of sanitary science. Conditions of really high sanitation were found among certain nomadic tribes in New Guinea, who probably resembled the first nomads, Abraham and Lot. The cave-dweller, on the contrary, lived in conditions as insanitary as those of the foul modern slum. The terrible scourging plagues that occurred amongst the Greeks were evidences of low sanitary conditions; and there were then imperfect means for the collection and distribution of water. Yet there were very early sanitary principles described in the Mosaic provisions with reference to the Israelitish camp for removing and burying excreta. The Mosaic ordinances for the instruction of the priest as to the cleansing of the leprous house had their analogy for the condition of unwholesome houses in modern times. One leprous condition was the dampness of walls, and in England now the common bricks absorbed as much as a pint or pound of water. Diseases of the most serious character, such as consumption and rheumatism, were the constant effect of damp walls, which were frequently to be found in old houses as well as in those just newly built. The conditions of insanitation prevalent after the Conquest might be seen in the Norman castles. Those strongholds must have had a double death-rate, equal to that of the worst of slums. It appeared from history that when population was exceedingly thin and unmassed, life, even in the very highest of conditions of society, was short, even compared with the present defective conditions. The beginning of the sanitary advance of population as well as of animals was by land drainage; and it was proved that where the subsoil drainage of the sites of towns had been effected, phthisis was reduced by one-half, and there was a corresponding reduction in the diseases of animals. The experiences of land drainage were of vast importance for colonisation, for where emigrants were located on undrained land fully half their children died from insanitary conditions soon after their fifth year. The great principle of sanitation upon which it was necessary to insist was circulation *versus* stagnation. The only true and vital sanitary plan was the drawing away at every moment, by an increasing central mechanical power, all the dead human and other animal excreta of communities, and the casting of such excreta upon the land undecomposed, so that they might, through the intermediate work of plants, break into life again, and give sustenance to man and animals. An examination of the work of the past seemed to open out a great future, especially for the working classes. Under sanitation every family might some day be provided with a dwelling-house well drained, well warmed, well ventilated, well lighted, well supplied with water, and with all comforts for the preparation of food and for the enjoyment of wholesome repose.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Glasgow Institute of Measurers.—The ninth annual meeting of the Glasgow Measurers' Institute was held on Monday, Mr. John Dansken, the president, occupied the chair. There are now 43 members on the roll. During the year Messrs. John Shields and Thomas D. Smellie have been elected the first honorary members. The funds of the Inslitute amount to £130 10s. Reference was made to the rules for the measurement of wright work adopted by the Institute, and issued to the members in January; and it was intimated that committees were now appointed to consider the modes of measuring brick, plumber, slater, and painter works. The office-bearers for ensuing year are:—President, John Dansken; vice-president, Robert Scott; secretary and treasurer, William Howatt; auditors of professional accounts, David Robertson and James D. Herbertson; other members of Council—James Howatt, John Morrison, Robert Reid, John H. Ramsay, Alexander Knox, Colin Young, and Robert Whitson.

Liverpool Architectural Society.—The first ordinary meeting of this society was held on Monday evening, at the Royal Institution, Colquitt-street. The president of the society, Mr. T. Mellard Reade, occupied the chair, and read his annual address, the subject being "Architecture, Ancient and Modern." Mr. Reade said he had always been an upholder of a free treatment of architectural details in opposition to the purist view, and he considered that the ideas of the best secular architects were insensibly converging towards more settled principles, even through the waves of fashion in style. Further advance would flow from architects attacking the varied problems of modern requirements in a correct and sensible manner, without too much stress being laid upon precedent or too free a use of architectural "properties." The new materials within the command of the modern architect, of which steel was an important one, would insensibly react upon the style of our buildings if architects only honestly aimed at conquering structural and other difficulties with artistic ingenuity. The modern buildings, like the ancient ones, if they were to rival or surpass them, should result from natural growth; but for good architecture to become general and of everyday use, the public, now so deficient in artistic sympathies, required educating. In Mediæval times good taste was general and natural to the individual, and so far as they could judge by the remains left them of the common habitations of the people, not at all confined to the church or the palace. Whether in these days of scientific education a similar agreeable state of things would ever be reached was a problem of the future; but architects should assist all in their power a movement in this direction by thoughtful study and doing their very best in the buildings intrusted them to design and build, acting on the good old principle of example being better than precept.

Northern Architectural Association.—A special meeting of this association was held on Monday at the Castle, Newcastle, Mr. Cresswell presiding. Mr. W. D. Dunn read a paper entitled, "Architects as Scientists." What position, he asked, did the architect assume in the rearing of the structure? Did the architect possess more knowledge than the contractor or builder? Was he able to take the tools from the hands of incompetent workmen and show them how to use them? If not, then he had failed to qualify himself for the more important position of "chief workman." He desired to bring home the relationship of architects to the claims of social, commercial, scientific, and religious progress. To the younger members of the profession he would say, "Study the old master thoughts—ruined, yet grand in their fossil beauty; the ancient forms and figures; be apt in Grecian, Roman, Saxon, Norman, and Gothic works of art and scientific construction. But do not copy. Let it be artistic and scientific thought and material, but only to enable you to reach the higher forms of beauty and truer forms of construction. Please your clients if you can, but do not destroy the principles of architectural skill for mere gain." He believed the time had come when the architect would not only have to distinguish himself with the pencil in producing the design, but also to acquaint himself with the use of the various tools used in the execution of the structure. In a word, he must enter into what was called the drudgery of practical work. The true architect should be a scientist to enable him to convey his views from the drawing paper to the materials and physical principles forming the structure. All architects might be efficient students in practical work; and the time had come when all students would require technical education, when the architectural workshops should resound with the note of the trowel, chisel, hammer, plane, and float. Was it not possible to have such workshops in connection with that association, and employ skilled artisans as teachers? Manufacturers and others would gladly supply material, if only as an advertisement for their goods. Members of the profession might be induced to present sums of money for the object. In conclusion, his plea was that architects should realise their responsibility, and demand public recognition of their rightful claims as leaders of lithological art and true sanitary scientists.

CHIPS.

Memorial stones of a lecture hall, now being added to Barnley-gate Wesleyan Chapel, Newark-on-Trent, were laid last week. The lecture-room is to seat 300 persons, and will cost £1,100. The architects are Messrs. Bottrill and Co., of Hull.

An organ, built by Messrs. Hamilton and Muller, for Park Church, Glasgow, having been sold in consequence of extensive alterations to that church, has now been erected by the builders in New Greyfriars' Church, Edinburgh, and was used for the first time on Sunday. The great organ contains 988 pipes; choir organ, 448; swell organ, 704; pedal organ, 150—total, 2,290 pipes.

The new Walker Engineering Laboratories on Brownlow-hill, Liverpool, now being added to the University College of that city, from designs by Mr. Alfred Waterhouse, R.A., will be opened by Earl Derby on the 2nd November. Good progress is being made with the adjoining Victoria College buildings and Jubilee clock tower by the contractors, Messrs. Brown and Backhouse, of Liverpool, and these are to be completed by the opening of the autumn term in 1891.

Designs are now being prepared by Mr. Kerr, chief architect of the Public Works Department of Victoria, for a seven-storied building in Little-Bourke-street, Melbourne, for the extension of the present General Post Office. The structure is to be of brick, with cement facings. The extension will be appropriated to the money-order and savings-bank branches. Upon the ground-floor of the new wing there is to be a banking chamber, 44ft. by 57ft., and the upper stories will be divided into suites of rooms.

The Easingwold rural sanitary authority have adopted a report and detailed estimates prepared by Messrs. Fairbank and Son, civil engineers, of Driffield, for proposed waterworks for the town of Easingwold. The proposal is to supply the lower parts of the town with water in mains from the spring now used and situate in Spring-street, and which yields 7,000 gallons in 24 hours. The water is to be collected into an underground service reservoir close by, holding 15,000 gallons. The estimated cost is £989.

Holy Trinity Church, Northwood, near Hanley, was reopened on Thursday, the 26th ult. The alterations include new heating and ventilating apparatus, the building of an organ-chamber, and the removal of the organ from the west gallery. The heating apparatus is on the small-bore system, and has been fixed by Mr. John Jackson, of Newcastle. The ventilators are by Robert Boyle and Son, and are self-acting. The organ-chamber has been erected on the south side of the chancel, with arches opening into chancel and south aisle, and has been built by Mr. T. Godwin, of Hanley, under the supervision of Messrs. R. Scrivener and Sons, architects, of Hanley. The removal of the organ was intrusted to Messrs. Jardine, of Manchester. The re-painting was executed by Mr. T. Bickley, of Hanley. The alterations have been effected at a cost of £330.

Building Intelligence.

Crosshill, Glasgow.—A new place of worship, erected at Crosshill for the Church of the New Jerusalem, was dedicated on Monday. The church is situated at the corner of Queen's-drive and a new street. It is built of dark red sandstone, and the style is Early English. The principal front has a gable about 60ft. in height, flanked by buttresses, which rise the full height, and terminate in panelled and moulded pediments. The entrance door occupies nearly the whole lower portion of the front, and has a moulded archway. Internally the church is cruciform on plan, consisting of a wide nave roofed in a single span, double transepts on each side, and a semicircular apse. The interior is lofty, and has a tie-beam roof, with moulded hammer-beams and semicircular main-couples, dividing the interior into six bays. The space between the couples is filled in with panelled wood lining. Moulded stone arches, supported on clustered stone piers, divide the transepts from the nave. The pulpit, which is in oak, is placed at the side of the apse, and the organ and choir will occupy the east transept. Besides the church, the buildings comprise a hall, seating 250 persons, vestry, choir-room, committee and library rooms, cloak-rooms, kitchen, and stores. Mr. John B. Wilson, Glasgow, is the architect.

Leeds.—New premises are about to be built in Quebec-street for the Leeds and County Liberal Club. The site contains about 957 square yards. Designs prepared by Mr. J. Wreghitt Connon (Chorley and Connon, Park-row, Leeds) have been adopted by the committee. The floor area will afford ample accommodation for 1,600 members. The style is Renaissance. The exterior walls be of red and buff brick, and the dressings of terracotta. The frontage to Quebec-street is 109ft., and this is divided into eleven bays. The ground-floor story is comparatively plain. It is rusticated with ornamented panels below the windows and cornice above. The largest amount of elaboration is on the first-floor stage. This is divided into bays by three-quarters detached and enriched Ionic columns, carrying a deep cornice. At the angle of this floor is an open covered balcony, from which speakers could address a crowd below. The second and third floor stages are relieved by windows having projecting pilasters and moulded cornices. At the east angle of the building the structure is finished with a wide gable, treated with carved copings, narrow enriched pilasters and modelled panels. The angle next to the White Cloth Hall is finished with an octagon open turret, having a high-pitched roof supporting a lofty flagstaff. The roof to Quebec-street is a Mansard one, broken up with dormers and covered with green Westmoreland slates. In the west front the treatment is plainer. The rooms on ground-floor include a hall-porter's room and a room for strangers, the staircase hall, billiard-room, with deeply-recessed fireplace, smoking-room, 68ft. long, the manager's office, the serving room, and the goods entrance. The first floor is approached by a spacious circular staircase 7ft. wide, leading to the dining-room 79ft. long, grill-room and private dining-room, reading-room, and serving-room. On the second floor is a large private dining-room, two billiard-rooms, two other private dining-rooms, a small card-room, and four bedrooms, together with service-room, members' lavatory, bath-rooms, &c. The third floor is entirely devoted to the service of the club, on it being arranged the kitchen, with store-rooms and receiving and serving-rooms, and accommodation for servants. The estimated cost of carrying out the scheme is £22,000.

Poynings Church, Sussex.—The old and interesting church of Poynings (Holy Trinity), near Brighton, is about to be restored. Plans have already been prepared for the work. The church is cruciform, the limbs being nearly equal. Over the crossing is a low square tower, embattled at the top. The interior has a fine oak screen of 15th-century date, now inclosing the south transept, of which the traceried work is still in fair preservation. This, we hope, will be placed in its right place across the chancel. The pulpit, also of oak, carved, is a very quaint piece of workmanship, with a sounding-board, and is of Jacobean date. There are three sedilia in the chancel. The arches that carry the tower are of Perpendicular character, also the windows; the east window is imperfect in the tracery, and certainly needs careful restoration. Externally the walls are of the usual Sussex flint rubble; the situation of the edifice on the flat table-land below the hills of the Dyke being charming.

Woolverstone, near Ipswich.—The village church of Woolverstone, situate in a park overlooking a reach of the river Orwell, was reopened on the 3rd inst., after restoration and enlargement, carried out for Capt. Berners from plans by Messrs. St. Aubyn and Wadling, of Lamb-buildings, Temple, E.C.; Mr. C. Tebbit was the clerk of works. The church, the chancel of which had undergone restoration in 1864, and at the hands of Sir Gilbert Scott, is generally Perpendicular in style, though portions belong to a considerably earlier period. It consisted, prior to the present alterations, of nave, chancel, tower, and north transept, with chancel aisle and vestry. The north transept, built in 1832, has been removed, together with the chancel aisle and vestry, in order to make way for the new nave and chancel. The new nave is 50ft. by 19ft. 9in., and is separated from the former nave, which is now converted into a south aisle, by an arcade of three arches. The arch which formerly divided the north chancel aisle from the chancel has been left, thus forming a fourth bay to the arcade. Five-light windows occupy the east and west walls. The roof is of English oak principals, grown on Capt. Berners's estate, similar in design to the roof of the former chancel, the timbers being all exposed to view and the space between the rafters plastered. The new chancel, 32ft. long by 19ft. wide, is divided from the old chancel (now a morning chapel) by an arcade of two arches, filled with wrought-iron grills up to the spring of the arches. The chancel has an open hammer-beam roof of English oak. The new choir and clergy vestries are together 29ft. long by 14ft. 6in. wide. The roof of the vestries is also of open-timber construction and of English oak, and plastered between the rafters.

CHIPS.

The Central Bank of London has opened a branch at the corner of Shaftesbury-avenue and Rupert-street, the fitting-up of same being done under the superintendence of Mr. Herbert Knight, 129, Cheapside, by Messrs. Colls and Sons.

New medical school buildings are about to be added to University College, Bristol, from plans by Messrs. E. J. Hansom and F. Bligh Bond, of that city.

The trustees of the Smith Memorial Buildings at Southam, near Leamington, were presented on Friday in last week with a stone pedestal, erected in the grounds by the Rev. W. L. Smith, to mark the site of the first Provident Dispensary in the kingdom, established there in the year 1823. The pedestal is of Portland and Hornton stones, and stands upon a granite base weighing four tons; it is surmounted by a large Bayham vase, with inscriptions on three of the sides. The work was executed by Mr. W. B. Sturley, of Southam.

Colonel North has intrusted the order for a large illuminated turret Cambridge-quarter clock and five large bells, weighing over three tons, with Messrs. Wm. Potts and Sons, of Guildford-street, Leeds. This firm has just finished a large turret quarter chime clock, with two 6ft. external dials, at the new Grammar School buildings, Ripon.

Mr. W. Billings, solicitor, of Leicester, who died recently, has by his will left £5,000 to the Leicester Art Gallery. The gallery will shortly receive a picture from Mr. Watts, R.A., which he has promised to present to the town.

A three-light stained glass window is about to be placed in the chancel of St. Nicholas Church, Hereford, as a memorial. The subject is the Ascension, and the artists are Messrs. Cox, Sons, Buckley and Co., of London.

Mr. E. J. Physick, sculptor, has just erected in the chancel of the parish church, Flint, a memorial of the late James Muspratt, of Seaforth Hall, Lancashire, the founder of the alkali trade of Great Britain; and of Richard Muspratt, of Trelawny House, and Cornist, Flint, who was for seventeen successive years mayor of Flint, and the head of the alkali trade in the north of Wales.

A new Wesleyan chapel at Sledmere was opened on Wednesday week. It is built of red brick with white brick facings, and is seated in pitch pine for 120 persons. Mr. Hodgson, of Driffield, was the architect.

The foundation-stone of St. Mary's lower middle school at Abbot's Bromley, Staffs, was laid on the 3rd inst. Messrs. Carpenter and Ingelow, of Carlton Chambers, Regent-street, S.W., are the architects, and Mr. Garland is the clerk of works.

Engineering Notes.

North British Railway.—A large amount of widening work and the construction of new branches is in progress for the North British Railway Co., chiefly in connection with the new Forth Bridge. Mr. James Carswell, chief engineer to the company, has just made his half-yearly report to the directors, in which he states that with reference to the improvement of lines north of the Forth, the widening of the line between Kelty and Mawcarse is approaching completion, and the embankments are made up. About 90 per cent. of the mason work in the bridges is finished, and 76 per cent. of the steel and iron-work is fitted up in position on the bridges. The culverts, drains, and fencing are practically completed; 8½ miles of the permanent way have been laid down and ballasted. The station buildings at Kelty and Mawcarse are nearly completed, and those at Lochleven, Kinrose Junction, and Milnathort are well advanced. In the widening of the line between Inverkeithing and Townhill Junction, the whole of the excavations have been taken out, and the embankments made up. All the bridges and retaining walls are practically completed, and the permanent way between Inverkeithing and Townhill Junction has been laid down and ballasted. About 85 per cent. of the excavations for the Dalmeny and Corstorphine Railway have been taken out and deposited in the embankments, 87 per cent. of the bridge work is completed, and three miles of a single line of rails laid down and ballasted. Since the 31st July the contract for the making of the Winchburgh line has been let, and the contractor is pushing on with his arrangements for getting the work carried out. Steady progress is being made with the Inverkeithing and Burntisland Railway, for which Messrs. John Waddell and Sons are the contractors, and it will be finished by December 31st. Of the Glenfarg Branch Railway, the contract for which has been taken by Messrs. Brand and Son, the first section to Cowdenbeath, three miles in length, will be completed by the end of the year, and one mile of the second section to Glenfarg, a further distance of ten miles, has been laid and ballasted, while the tunnels and earthworks for the remaining section are making progress.

Portknochie, N.B.—The new harbour which is being formed at Portknockie, near Culler, on the Moray Firth, is approaching completion, and is expected to be finished within two months. The engineers of the works are Messrs. D. and J. Stevenson, Edinburgh, and the contractors Messrs. Alexander Morrison and Son, Edinburgh; the total expenditure will not much exceed £10,000. The work has been two and a half years in construction. The concrete blocks, which form the main breakwater, and of which seven or eight have already been laid, vary in weight from 800 to 1,000 tons. Large masses of rock had to be blasted before the breast-wall, 200ft. in length, and which forms an approach to the harbour, could be made. Then a wall 43ft. long was run out seaward, and the main breakwater, over 130ft. in length, and attached to the 43ft. wall, advances still further seaward and across the present natural harbour mouth. In order to strengthen this wall a large number of 23 ton concrete blocks have been deposited behind it. From the extreme point of the breakwater there stretches in a south-westerly direction the canted end of breakwater, which will have a total length of 85½ft. With troubled water playing all round it, the interior of the harbour is as still as an inland lake. It has a depth of from 10 to 12ft. of water inside at the lowest tides, and 26ft. at high water. The inside area is from 3½ to 4 acres, and it will accommodate about 200 large fishing-boats.

The Bishop of Southwell has opened a mission room in connection with St. Barnabas's Church, Derby, the same having been erected by some 70 working-men volunteers in their leisure hours. The structure has cost £500, but would not have been erected for £1,000 had it not been for the free help of the workmen.

The principal rooms of the hall belonging to the Salters' Company, St. Swithin's-lane, E.C., including the banqueting-hall, are now undergoing re-decoration. The work is being executed by Messrs. Johnstone, Norman, and Co., under the direction of Mr. H. Dawson, surveyor to the Company.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

REX.—(The formula we gave you was quoted from D. K. Clark's Manual, and is Mr. Unwin's formula for columns of angle, tee, or channel sections. Gordon's formula for calculating strength of cast-iron pillars (round) is for pillars with both ends flat and bedded, the following :—

$$f = \frac{a}{1 + b\,r^2}$$

and when ends are imperfectly fixed—

$$f = \frac{a}{1 + 4b\,r^2}$$

in which f = breaking weight per square unit of section, r = of length to diameter, a and b = constants depending on material and section of pillar, a being a close approximation to the crushing unit strength of material. Referring to Clark's Manual, we find the numerator is as given, 19^a).

R. J. T.—(A story is the suite of apartments on the same level or between two floors, its height in the By-laws being measured from floor to floor, not from floor to ceiling. Of course, a story means every separate floor, and includes the ground-floor. The houses you describe are of three stories.)

RECEIVED.—A. B. W.—L. G. I. Co.—J. L. A.—J. M. C. and Co.—E. E. C. and Co.

Correspondence.

RESTORATION AT ST. ALBAN'S.

To the Editor of the BUILDING NEWS.

SIR,—Many persons are beginning to ask when the very foolish and almost hysterical correspondence about St. Alban's Abbey is to end.

Without attempting to criticise the various points at issue with regard to this vexed subject, I would ask (the true artists and lovers of ancient work who have favoured the profession with their views upon what they seem to think is wholesale vandalism at the Abbey) why they have not made some vigorous efforts by means of combination to put a stop to Lord Grimthorpe's proceedings?

Perhaps, after all, they do not really care as to what befalls St. Alban's Abbey, and have merely written for the sake of writing, and because it is fashionable to cry out when restoration work is commenced upon any old building, and because it is the desire of most men to criticise the work of others.

Personally, I maintain that under the peculiar circumstances of the case in point, Lord Grimthorpe has acted as he had a perfect right to do. At the same time, whilst we must all deplore any wanton destruction of ancient and beautiful work at St. Alban's, and may naturally tremble for the safety of the exquisite central tower, if it should meet with the ruthless fate which it is said hovers over it, I do not see whom we have to blame but ourselves, and I should like to know why these true artists and lovers of ancient things do not combine together as one man, and say that St. Alban's Abbey shall not be further restored, except under certain conditions.

May I also ask why the "R.I.B.A." has been silent so far in this matter? I am afraid that we are still a profession without either the will or power of combining, and, as a natural consequence, we fail to raise our voice when occasion offers, and merely bring ourselves into contempt in the eyes of the world.—I am, &c.,

Oct. 9. W. H. R.

SAINT CUTHBERT'S CHURCH, EDINBURGH.

SIR,—It has been the fate of this time-honoured structure to fall behind the general architectural advance which has characterised its surroundings. If the neighbouring buildings now wear an aspect "blithe as birds in June," the shade of St. Cuthbert's casts a chilling look like that of "old grey-haired December." It is not difficult to account for the "lethargic dump" that has overtaken this building. Many persons, directly interested, have doubtless contemplated, with not too comfortable feelings, the possible danger of awaking it, at least prematurely, from its long, deep slumber. Like a redundant overgrowth, however, the time has come for it to pass under review of "the powers that be," and either be dismissed with an admonition, handed over to a reformatory, or suffer extinction. What, then, is the decision that has been come to in the case of St. Cuthbert's Church? It can scarcely be credited, if it were not true. The excrescence is not to be removed: the reformatory alone is the goal of its hopes! It may be explained that the site of St. Cuthbert's Church is as that of a sunk flat compared with the street elevation. The middle of the structure is as nearly as possible in line, or on level, with Princes-street; and, were it not "half-hidden from the eye" there, by the foliage of the trees, it would present a cadaverous aspect, even to the most careless onlooker. To reach it, it is necessary to make a deep descent from the roadway; and this circumstance, as well as the altered character of its surroundings, forces the conviction, that such a site is unsuitable for any modern erection whatever. Many persons, on first hearing of the proposal to reconstruct the church on its prest site, tacitly demurred thereto, feeling sure that a counter-proposal would emanate from official or other quarters of the city; but it is now seen that a vigorous protest will be required to save the Scottish capital from an untoward perpetration. In the hope of contributing to so worthy an object, a plea is here advanced for its removal, and *against* its continuance in a patched-up garb as proposed.

Regarding the site, it has been pompously spoken of as "the finest in Europe"; but, it may be asked, whoever read in the inspired writings of people *descending* to the House of God? Or, will anyone be found in this 19th century declaring that the time is not past for worshipping in crypts and catacombs?

"Ah!" replies an objector, "would you ruthlessly remove an historic landmark?" Alas! yes; though to do so must ever be matter for regret. But is a landmark never to be removed? and is the time not plainly opportune for its removal? Wherefore else is the need for the artist's canvas, or the photographer's camera, if not to "secure the shadow ere the substance perish"?

"But," retorts a second objector, "would you have us remove the handsome steeple which we have looked upon approvingly for so long?" Is it necessary, we reply, to remove the tower, though the main building be removed; or can the collective wit of the architects of the Scottish metropolis not devise a plan by which it can be retained as an independent "thing of beauty"? In any case, it is surely expedient to choose the least of two evils, when choice is thrust upon you. By way of caution, also, we might remind you how the good people of Gainsborough did a century ago, and with what result, in the following extract:—

"The parish church of All Saints possesses a peculiar interest. The beauty of the Gothic is here replaced by the dignity of the Classical. But, as if to preserve something of the character of the ecclesiastical edifices of the county, the church has retained a tower of the Perpendicular order. Some time between the years 1740 and 1748 there was substituted for the original nave and choir what was doubtless considered a more imposing structure of the Greco-Roman style. The tower, however, was handed down to posterity along with the doggerel:

Gainsborough, proud people!
Built a new church
To an old steeple."

By substituting Edinburgh for Gainsborough, therefore, history will repeat itself, if the reconstruction of St. Cuthbert's Church is proceeded with as proposed.

"But," chimes in another objector, "Give us something like precedent for such an act of Vandalism as you would have us perform." The following is plainly such, taken from the Edinburgh *Evening Dispatch* of date July 3, 1889:

"Many Oxford men will be horrified to hear that the town council propose to ask for Parliamentary powers to enable them to pull down Carfax Church."

There is yet another objector, who propounds the inquiry, "In the event of the promoters giving way, or not proceeding with the work of reconstruction, what gain is promised them and the city for the loss of their time-honoured church and site?" The question is an important one, and we reply that, by the removal of the church, an ungainly object—impossible to be made gainly—would be taken away; a principal western entrance to the gardens would be available; an enchanting view of the Castle Rock, and of the Mound Buildings, and of the full length of the gardens would be obtained; a new and important site would be enriched with an edifice worthy of the traditions of its predecessor; and augmented subscriptions would almost certainly flow in from citizens and sectaries alike, and from Scotchmen who desire to see their capital city progressive.

It remains to be seen if the promoters of this singular proposal will patriotically sink their sectarian rights—to them of the nature of a trust—in their larger and more representative character of citizens; or if the city's spirited councillors will yet be found emulating the good example of their brother magnates and great English rival.—I am, &c.,

AUDI ALTERAM PARTEM.

DESTRUCTION OF ANCIENT BUILDINGS.

SIR,—I have read with much interest your powerful leader on the destruction of ancient buildings by so-called restoration. But what do you think of a gentleman who having the ruins of an abbey on his estate, pulls them down piecemeal?

A painful case of this kind has recently occurred not far from here. "Egglestone Abbey," about a mile from Barnard Castle, was a house of the Premonstratensian Canons, and till recently had the north and west walls of nave and the north transept, of about 1200; the chancel and south side of nave, about 1250; and the south transept, about 1350; and, in addition, a considerable part of the domestic buildings, of various dates from about 1200 to about 1500. The north transept was particularly interesting, as, in addition to some 12th-century windows, it had the doorway leading from dormitory into church, and a few years ago had also the steps. Judge of my horror at finding in a recent visit that the whole of the north transept and the south end of the domestic buildings have recently been taken down to the very ground, so that even the plan cannot be traced. The domestic building could hardly be called a ruin, as it was roofed in. Such roof was certainly not of an ornamental character, and I am not sure of its date, part of it at least being modern; but it protected the walls, and presented the appearance of a domestic building of the White Canons. Well, the whole of this roof has been removed, and the walls left to the tender mercies of the elements.

You will naturally think all this has been done by some ignorant "Yokel," who sees no difference between the ruins of an ancient church and a modern barn; not so, sir, it has actually been done by an educated country gentleman—Mr. Morritt, of Rokeby Park, a descendant of the Morritt to whom Sir Walter Scott dedicated his splendid poem of "Rokeby," and in whose house

and grounds the poem was written, the closing scene in the tragedy being laid in this very church at Egglestone.

In a correspondence I have had with Mr. Morritt, in the columns of a local paper, he justifies himself on the ground that part of some wall was blown down, others he thought were unsafe, the roof was giving way, &c.; so he saw no harm in taking down all I have above-named and carting it away to build a stable at Rokeby.

The masons, who were redressing the stones on the spot, prior to removal for such purpose, told me they thought some more was to come down, as it was unsafe; and I therefore ask antiquarians, through your columns, to protest against such demolition. I have frequently seen the ruins for the last 30 years, and I do not believe any part was unsafe, or if unsafe in its neglected condition, might have been made safe by a trifling outlay in Portland cement; and the roof might also have been repaired so as to preserve the domestic buildings from falling into ruins.

Mr. Morritt may say that the place is his own, and he has a right to do as he likes with it—legally no doubt he has, but not morally. He came, by the "accident of birth," into possession of a place for which "he toiled not, neither did he spin," and the public have for generations—no doubt ever since Bluff Hal took it from the successors of the builders, and gave it to some Court favourite—had access to the ruins; and hundreds of archæologists, as well as thousands of ordinary visitors, visit them every year. Surely Mr. Morritt, in so succeeding to the privileges of the place, has succeeded also to the duty of keeping it in repair for the "user" of the public. If part was blown down, all I can say is, he ought to have strengthened it in time to prevent its being blown down. If part was unsafe, or appeared to Mr. Morritt unsafe, he ought, under proper professional advice, to have made it safe, and protected the tops of the walls from the wet getting in. If the roof was rotting away, surely Mr. Morritt, as a gentleman of high social position, and ample means, could have afforded to repair or even renew the roofs, and so have earned the gratitude of all lovers of the past, instead of the reverse, as he has done.—I am, &c., J. P. Pritchett.

24, High-row, Darlington, Oct. 7.

VENTILATION OF GEYSERS.

Sir,—We ask the favour of your assistance in warning tradesmen against fixing geysers without a ventilating pipe to carry the fumes of the gas outside the bathroom, and also in urging upon those who have the specifying or oversight of such work, that they should specially insist on this very simple, but absolutely necessary, precaution.

The recent accident at Brixton has called public attention to the risk of using geysers without the proper pipe; but we know from experience that the panic is likely to subside very shortly, when people will act as recklessly as ever. Besides, there is a danger of the alarm expending itself by being led off on a false scent. Someone is reported to have said at the inquest that geysers should never be used at all, and a gentleman writing since calls them "death-traps." Of course, such sweeping condemnations fail of their effect now that so many thousands of geysers are in constant use, with every satisfaction to their owners.

It is sufficient for the public security, and much more likely to be attended to, if the simple and inexpensive precaution of fixing a ventilating pipe is urgently insisted upon.

We offer, wherever a geyser bearing our name has been fixed otherwise, to supply and fix the pipe free of charge. If other manufacturers will take the same course, we shall be spared the horror of reading of any more cases of asphyxia.—We are, &c., Ewart and Son.

346, Euston-road, Oct. 9.

MASONRY CLASS AT SOUTH KENSINGTON.

Sir,—We earnestly request your favourable consideration of the inclosed syllabus of Masonry Class to be held at South Kensington under the direction of Mr. Lawrence Harvey, F.R.I.B.A., &c., and should you believe the lessons therein are calculated to give a sound knowledge of masonry and construction, and prove a scientific basis of training for masons desirous of rising to the positions of foremen or clerks of works, we respectfully solicit your help to bring these lessons within their reach.

The Council of the City and Guilds of London Institute either cannot or will not reduce the high fee demanded of 2½ guineas, therefore we, the undersigned, have formed ourselves into a committee to receive subscriptions from friends who consider our cause a good one, and tending to raise the general tone and character of a large body of workmen.

We propose reducing the fee to 25s. each for all bona-fide masons, and even this amount, with the addition of railway fare and other expenses, forms a large sum for masons to pay, and it is to their credit that many are now anxiously awaiting the result of this our effort in their behalf.—We are, &c.,

Members of the Committee.

J. Wormell, foreman mason, B. E. Nightingale, Albert-embankment, S.E.
R. Bond, foreman mason, Adamson and Sons, Putney.
J. Pratt, foreman, G. Seale, Apollo Works, Walworth.
E. Shopland, masonry contractor, Battersea-square.
T. Hassell, foreman of masons, Messrs. Macey and Sons, Battersea.
G. Pile, masonry contractor, 81, Bridge-road, Battersea.
W. Kenney, foreman mason, London Steam Stone Saw Mills, Limited.
J. Hamblin, foreman mason, J. W. Habbs.
H. E. Neale, inspector of terracotta work, Messrs. Doulton and Co. Lambeth.
Robert Stewart, foreman of works, Messrs. Crew Bros., Cumberland-market, N.

Subscriptions may be sent to me at the following address, A. Findlay, Hon. Sec.,
General Foreman London Steam Stone Saw Mills, Limited.
17, Shepherd's-place, Upper Kennington-lane, S.E., 27th September.

CUTTING ARCH-BRICKS.

Sir,—I see in your issue of the 4th inst. a letter from "Terracotta" regarding cutting arch-bricks. I beg to state that this method has been in use at these works for a considerable time.—I am, &c.,

Chas. Brooke Canning, Manager.
Terracotta Works, Ruabon, Oct. 7.

CHIPS.

St. Luke's schools, Blackburn, are about to be enlarged by the addition of two class-rooms on the east of two floors. The accommodation will thus be increased from 546 to 706 school places at an estimated cost of £660. The architects are Messrs. Angelo W. R. Simpson and Duckworth, of Blackburn.

Mansfield College, Oxford, which has been built from Mr. Basil Champney's designs, will be opened on Monday next, the 14th inst.

A stained glass memorial window has this week been placed in the north side of the chancel of Long Sutton Church. The subject is the Virgin Mary bearing the infant Saviour, and attended by Mary the mother of Cleophas and Mary Magdalene. Messrs. Burlison and Grylls, of London, are the artists.

The decoration of the chancel of All Saints' Church, Southampton, has recently been carried out by Mr. C. A. Vaughan, Southampton, from a design by Mr. A. Morden Mowbray, of Oxford, and the result of the work has been to complete the re-decoration of the interior of the sacred edifice. The panels in the ceiling are painted ultramarine blue, with gold pateræ, and the stiles ivory colour. On the upper part of the east wall the Holy Spirit is represented descending in the form of a dove, in white and gold. The rest of the wall is brought out in pale and dark terracotta, white, and blue.

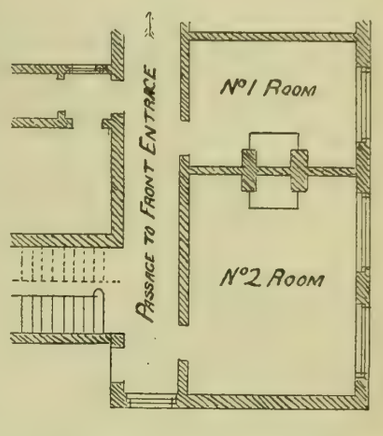
The new Conservative Club in Croft's Bank-row, Urmston, near Warrington, will be opened on Saturday, the 19th inst. It is built of red and white bricks, and cost £1,500, the two principal rooms being a public hall, 70ft. by 33ft., fitted with stage, and a billiard-room 34ft. 6in. by 33ft. Mr. Spark, of Urmston, was the builder.

Considerable additions have been made to Roughway Paper Mills, Wrotham, and special attention has been paid to the ventilation, the latest improved form of Messrs. Robert Boyle and Son's patent self-acting air pump ventilator being adopted for the extraction of the vitiated air.

Intercommunication.

QUESTIONS.

[10110.]—**Smoky Chimneys.**—I should be glad of information to solve the following. Some of the rooms in a new wing lately added to an old house smoke when the doors are shut; others do not. No. 1 room smokes when the door is shut; No. 2 is not affected in any way by opening or shutting the door. Do the relative positions of door and fireplace cause it to smoke when th



door is shut? If so, where should the door be, or what is the cause? (Sketch shows position of rooms.)—J. S.

[10111.]—**Cast-Iron Pillars.**—Will some experienced reader kindly quote any reliable formula for the strength of cast-iron pillars or stanchions of channel or double channel section—that is a common ⊢ form with middle rib.—Rex.

[10112.]—**Timber and Joinery.**—The question has arisen whether timber (specified, say, 4in. by 3in.) is allowable 3⅞in. and 2⅞in., also if a do or specified 1⅛in. is admissible 1⅜in., and if 1⅛in. sashes are 1⅜in. finished. The point is, that the saw-cut and working spoils ⅛in. of wood, and therefore the contractor is justified in charging for it. There are three local opinions given—one claiming that it is allowable to make the allowance in thickness—one that it used to be a custom that has rightly been allowed to fall into disuse—one that it only applies to timber merchants who sell and saw?—Windsor.

[10113.]—**"Sanitas" Closet.**—I shall be glad of information as to "Sanitas" closet. I am well acquainted with the "Unitas."—W. A. G.

[10114.]—**Floor Stiffening.**—Is it important that joisted floors should be herring-bone strutted before boards are laid, or will it be equally effective if done along with the boarding?—Schemer.

[10115.]—**Stanchions of Cast-Iron.**—Will one of your engineering readers refer to any work treating on the strength of pillars of this kind? The sections are of the channel and double-channel shape, or a double-flanged girder with a middle rib on each side.—G.

REPLIES.

[10089.]—**True North.**—The declination of the needle from the North of the earth's axis is always changing, and now approaching zero in its oscillation. The latest determination of it which I have met with is for 1881, being 18·5° West for London.—M.

[10092.]—**Cement.**—I fancy that the hardening of the water must be imaginary. If it does occur, it is due to the carbonic acid in the soft water acting on the lime in the cement. I don't understand how it can be important and continuous. The perfect remedy would be a coating of asphalte, or an easier and cheaper expedient an application of the Crown damp-resisting fluid of Chambers, Hull.—M.

[10099.]—**Domestic Hot-Water Supply.**—Until now I have always used the same size of pipe for flow and return from boiler; but a plumber who has been doing work in which I am interested, has put in 1in. flow and ¾in. return, saying it is better, seeing that the water in becoming heated is more bulky, consequently the circulation is more rapid.—Teachable.

[10100.]—**Questionable Wood Flooring.**—I am surprised to learn so few dwelling-houses in the London district have the floors laid with tongued and grooved boards. I have carried out house and cottage work for over 25 years back in Halifax and surrounding districts, but have always had the wood floors laid with tongued and grooved boards; nor have I seen them done otherwise here, unless the floors have been double-boarded, and the upper and lower layers lapped at the joints. R. Watson states: "No harm is likely to arise from the causes mentioned." In staying at the seaside in winter I have found the bedrooms cold and draughty—the latter nuisance being increased on putting in a fire—the air to supply which rushed up the joints of boards from a chilly quarter, anything but assuring as to its purity. On examining the floors, in each case my penknife blade slipped through the joints quite easily. Is not the air supplied through the crevices of such boarding likely to be detrimental to health, coming, as it does in many cases, from fusty spaces under ground-floors, full of ground air—often traversed by sewer-pipes—and a warren for vermin; the upper-floor spaces between ceilings and boards being, in most instances, charged with similar impurities, including the outwalls? What is to prevent the plaster ceilings under straight-jointed boarding from becoming greatly discoloured and disfigured in washing

floors over, when laid like sieves? I find there is so little difference in the cost of straight-jointed and tongued boards that, in adopting the former (except in special cases) it is false economy.—Tolop.

[10104.]—**Noise from Billiard-Room.**—What I would suggest, and what I feel confident would admirably suit the requirements, would be to lay silicate cotton or slag wool (which is now recognised to be the best non-conductor of sound known) between the floor-joists, and on top of that fix sarking felt, so that it comes immediately under floor-boarding. By this means, the sound will not only be effectually prevented; but there will also not be any chance of the propagation of vermin, which otherwise would be the case where sawdust or ordinary hair-felt is employed.—P. Lambert.

[10104.]—**Noise from Billiard Room.**—You may board the ceiling joists, and lay 2in. or 3in. of deafening upon it. An air-space should be left between the upper floor and ceiling, and beneath the upper boards felt may be laid. If these precautions are taken, I do not think the noise will be much. The ends of joists should be laid on felt or slag wool, so as to deaden the transmission of sound down the walls.—G. H. G.

[10105.]—**Helps on Sanitary Science.**—I should recommend "An Intending Candidate" to read Corfield's "Laws of Health, Water Supply, and Sewerage," Latham's "Sanitary Engineering," Parkes's "Practical Hygiene," besides the Acts and Statutes. The Public Health Act and By laws ought to be well studied.—G. H. B.

[10107.]—**Assistants in the Office of Works.**—If "J. C. T." requires full and reliable information, he had best write to the Secretary of the Civil Service Commission, Cannon-row, S.W., for particulars of the following exams., which are all of a similar character—viz., Assistant Surveyors, Junior Examiners, and Clerks of Works (Office of Works), Assistant Surveyors (Royal Engineers), Accountant Clerk, and Architectural Draughtsman (Admiralty—separate exams. for Head-office and Outports), Assistant Surveyor of Buildings, Surveyor of Buildings, and Clerk of Works (Public Works Department, Ireland). It is rumoured that the initial pay and prospects of Assistant Surveyors in the Office of Works will shortly be improved; but nothing is determined yet.—G. A. T. Middleton.

[10107.]—**Assistants in the Office of Works.**—Having obtained the first place in one of these competitive examinations, I thall be pleased to give "J. C. T., or any other intending competitor the information required, if they will write me, inclosing stamped envelope for reply.—T. C. Hunter, 8, Albany-road, Rochester.

[10108.]—**Building Line.**—It appears, from the statement of "A Builder," that very few buildings have been erected in the road in question, and it would be well to get the Local Board to settle the frontage line for the whole street. The distance named—20ft.—is sufficient. It would be most unreasonable to expect the set-back to be 100ft. when, in some cases, the plots might not exceed that depth.—H. L.

[10108.]—**Building Line.**—The local authority have power to make an owner set back a new building to a general line with those that are built on either side.—G. H. G.

[10109.]—**Brewhouse Floors.**—I should leave the centres in for at least ten days, and, if possible, for fourteen days. Use seven parts of broken bricks and gravel to one of Portland cement.—H. L.

CHIPS.

Works of water supply are about to be carried out at Methley, near Normanton, Yorks, at a cost of £7,000, from plans by Mr. Richardson, C.E. At a Local Government Board inquiry, held on the 3rd inst., relative to the borrowing of the money for the purpose, no opposition was raised to the proposal.

The parish church of St. James, Longton, Staffs., was reopened last week, on the completion of alterations and repairs. The floor of the chancel, which was formerly on the same level as the nave, has been raised and laid with encaustic tiles, and the old choir stalls have been replaced by some carved oak ones. The gallery at the west end of the church has been lessened by one bay window, and a new front has been erected. A new system of ventilation has been introduced, and the exterior of the building has been overhauled. The alterations have been carried out by Messrs. H. and R. Inskip, and the decorations by Mr. A. Gee, of Stafford. The total cost will be about £1,200.

New Board Schools in Melville-road, Ford, were opened last week by the Devonport School Board. They are semi-Gothic in character, and built of black limestone nobbling, relieved by quoins and facings of grey limestone. Accommodation has been provided for 350 children, at a cost, exclusive of fittings, of £2,700. Mr. John Reed, of Plymouth, was the contractor.

The Birmingham School Board passed a resolution at their last meeting requiring all contractors to sign an undertaking not to pay less than the minimum standard rate of wages in the district.

On Saturday afternoon Mrs. W. J. Legh, of Lyme Hall, Cheshire, laid the foundation stone of a new church, to cost £4,300 at Haydock, near St. Helen's. The plans have been prepared by Messrs. Douglas and Fordham, of Chester. Accommodation will be found for 574 persons. The present contract with Mr. Thomas Browne, builder, of Chester, is for £3,500; but the total cost, including fittings, &c., will be about £4,300.

WATER SUPPLY AND SANITARY MATTERS.

Blidworth, Nottingham.—On Thursday last, the 3rd inst., the Blidworth Waterworks were formally opened, when the Mansfield Rural Sanitary Authority were entertained at luncheon by Mr. Herbert Walker, A.M.I.C.E., of Nottingham, the engineer of the works. The Rev. R. H. Whitworth, the Vicar, in proposing the health of the engineer, remarked that although he was originally opposed to the scheme, he now fell in with it entirely, believing it was the best thing that could happen to the parish. In response, Mr. Walker reviewed the history of the waterworks question at Blidworth, saying it dated back as far as 1883, when he was called upon by the late Sir Arthur Need to devise a scheme. He did so at an estimated cost of £2,000. The parishioners thought that too much, and propounded one of their own to cost not more than £300. This, however, failed, and finally his scheme was adopted. He took this opportunity of saying that the work had been most satisfactorily carried out by Mr. J. F. Price, of Nottingham, the contractor. The water is obtained from a well sunk in the new red sandstone, and is elevated by means of a small horizontal steam-engine and three-throw pumps, by Messrs. Tangyes, of Birmingham, to a reservoir 200ft. above the engine-house. The quantity of water obtainable is practicably unlimited, and it is proved by analysis to be of most excellent quality.

Bradford, Yorks.—The Bradford Corporation will apply to Parliament next session for power to obtain from the Nidd Valley an addition to the towns supply of water. The scheme and report have been prepared by Mr. A. Binnie, the waterworks engineer. It is intended to deal with the flow from 18,200 acres in such a manner as to give to the town the benefit of a large amount of pure spring water, which flows out of the millstone grit formation, of which, with the exception of 315 acres, the drainage area entirely consists, the flood water passing down into a compensation reservoir, where it would be stored and settled for the use of the river Nidd. By thus selecting the spring water and the clear bright flow of the streams, a considerable improvement is proposed by mixing the clearer water from the Nidd Valley with that in the present reservoirs at Barden, Chelker, and Heaton. The scheme provides for the work being done in six different instalments, the total for the entire project being 17·30 millions gallons a day. On the question of cost, Mr. Binnie estimates that the whole scheme will require a capital of £1,222,000, the first instalment, waiting capital, £388,000, being £91,250 per million gallons. These estimates, over and above the cost of works, include £20,000 for Parliamentary and law expenses, and £107,200 for contingencies. The complete scheme will involve the construction, for town supply, of three reservoirs on the Upper Nidd, situated at Woodale, Haden Carr, and Angram, and a conduit from Woodale to Bradford, which, besides the waters of the river Nidd at Woodale, will receive the flow of 48 streams and springs flowing from the millstone grit formation. This conduit, passing in a tunnel under Greenhow Hill, will be carried into the valley of the Wharfe, and so by way of Barden, Chelker, Gilstead, and Heaton, to Bradford.

Erdington Sewerage.—A Local Government Board inquiry was held on October 4th, at Gravelly Hill, near Birmingham, and presided over by Mr. Arnold Taylor, engineering inspector. The Aston Rural Sanitary Authority applied for powers to borrow £5,000 for the sewerage of a part of the Erdington and Wilton special drainage district. Mr. W. H. Radford, sanitary engineer, Nottingham, is the engineer for the scheme, and he explained the plans.

Sanitary Inspectors' Association.—The sixth annual general meeting of the Association of Public Sanitary Inspectors of Great Britain was held on Saturday evening at the Westminster Town Hall, Mr. Hugh Alexander presiding. The report stated that the council had not been indifferent during the past session to the progress of legislation as it affected local government and its bearing upon public health. As a District Councils Bill could not be introduced no movement had been made during the session. The report expressed disappointment at the limitation of the compulsory operation of the Infectious Diseases Notification Act to the metropolis, and avowed an intention on the part of the council to use every opportunity which might present itself to amend the Act. During the year 61 new members had been added to the association, and the members had to be congratulated on a year of much solid progress, of full harmony in purpose, and of a wide development in brotherhood among the sanitary inspectors of the kingdom. The meeting decided to hold the next annual meeting at Leamington.

The partnership heretofore subsisting between Messrs. Archer and Green, of Buckingham-street, Strand, W.C., architects and surveyors, has been dissolved.

LEGAL INTELLIGENCE.

Breach of House Drain Regulations.—At West London Police-court on Saturday, Alfred Heaver, a builder, appeared to answer summonses charging him with constructing drains on the Hyde Park Estate, Wandsworth Bridge-road, contrary to the regulations of the Fulham Vestry. Three summonses had been taken out for putting in drains without Portland cement, and covering them over prior to inspection. The other was for connecting the drain through the party wall into the next house. Since an adjournment the defendant had, it was stated, remedied the various defects, so that the whole estate was now properly drained. A correspondence was read, from which it appeared that drains on other parts of the estate were constructed in a similar manner and passed. In one letter there was a complaint of the captious conduct of the new drain inspector. The assistant surveyor was questioned, and said he could not state whether the drains had been laid without concrete. He did not think they were. Mr. Curtis-Bennett said that before he decided the case he should appoint an independent surveyor to examine the drains. It was of no use for the vestry to pass resolutions if the officers passed works which the vestry would not have allowed. When the works were brought to their knowledge by their new inspector, who had done his duty, proceedings were taken against the defendant. The summonses were then adjourned, Mr. Curtis-Bennett stating that he would name the surveyor to inspect the drains.

STAINED GLASS.

Aberavon.—A grand five-light painted glass window has been placed in the east end of Aberavon Church. The window has been carried out by Mr. Dixon, of London, under the direction of Messrs. Kempson and Fowler, of Llandaff, the subject being "The Adoration of the Magi." Messrs. Kempson and Fowler are also engaged upon an elaborate reredos for the same church, the constructional part of which is being worked by Mr. Clarke, of Llandaff, in alabaster and marble. A considerable portion of it is exhibited at the Art Exhibition, which is open this week in connection with the Church Congress at Cardiff. The sculpture for the reredos is being modelled and carved in white marble by Mr. H. H. Armstead, R.A. A new pulpit, chancel seats, and floors have also been designed by Messrs. Kempson and Fowler, and these, it is expected, will be executed by the time the reredos is finished.

The Lord Provost's committee of Edinburgh town council has approved of the form of a petition to the Queen asking her Majesty to institute an inquiry into the past and present administration of the Royal Scottish Academy, and the application of its funds, before the new charter asked by that body is granted.

The abbey church of Selby is about to be restored, from plans prepared by Mr. J. Oldrid Scott, F.S.A. The first works to be undertaken will be to make the north transept and its roof safe, and the north transept window will be filled with stained glass at a cost of £600, by a private donor. The upper portion of the great east window is also being restored.

Workmen are at present engaged in demolishing the old burgh school in School Wynd, Arbroath, built about three centuries ago. A number of stones of the abbey have been found built into the walls. One of these is finely carved, in the form of a canopy, on two sides. It had apparently been part of a reredos of a stall canopy. It had been gilt, and the traces of gilding were distinct all over the carved part of the stone.

The new chapel of St. Nicholas, attached to St. Margaret's Episcopal Church, Gallowgate, Aberdeen, was consecrated on Monday by Bishop Douglas. The chapel has been added as the first part of a scheme for enlarging and beautifying the whole of the church. This includes the heightening of the present building, extending it both at the west and the east end, building a chapel at the north-east, new vestries, and two turrets, the whole of the church and chapel to be vaulted in brick, with stone ribs. The chapel is from designs by Messrs. Bucknall and Comper, architects, London.

A special meeting of the Newcastle Sanitary Committee was held on Monday, to consider the reorganisation of the sanitary department under the superintendence of Dr. Armstrong. The whole of the details were gone through with respect to the work and hours of the sanitary inspectors. It was arranged that any complaints respecting the unsanitary state of ashpits, dwelling houses, yards, slaughter-houses, &c., should be made at the various police stations in the city, the same as was done regarding the cleansing of ashpits, and also complaints should be received at the residence of the sanitary inspectors; and that a book be kept to register all such complaints.

Our Office Table.

Mr. Alpheus Cleophas Morton, who was elected for Peterborough on Monday, is an architect and surveyor practising in Chancery-lane, and one of the representatives of the Ward of Farringdon Without in the Common Council of London. He was born in 1840, and is the second son of the late Mr. Francis Morton. He is also a member of the Wandsworth District Board of Works and of the vestries for Clapham and St. Dunstan in the West. He was an unsuccessful candidate for Hythe at the general election of 1885, and for Christchurch, Hants, at that of 1886. He now enters Parliament for the first time.

The London County Council are showing great energy in planning some long-needed improvements in the central districts of the metropolis. Following up their resolution of last week to seek Parliamentary powers to remove the south side of Holywell-street, the Council considered, on Tuesday, a committee's proposal to seek powers to form a new street from Holborn to the Strand giving direct access between Waterloo and the three northern railway stations. The new thoroughfare will commence in a line with Southampton-row, and will cut across a maze of courts and narrow lanes to the junction of Catherine-street and the Strand. At a point about 500 yards from the Strand a spur street will leave the new thoroughfare and run eastwards to St. Clement Danes Church. Both these streets will be 90ft. in width, and will be planted with trees on each side. The approaches to Waterloo Bridge will also be improved by removing a portion of the buildings at both sides of its junction with the Strand, so as to form a semi-circus.

This very complete scheme, if carried out, will cut through and destroy a considerable area of poor and dilapidated property, and will not prejudice the construction of any future projected street running parallel with the Strand. The approximate cost of the proposed improvement is: Engineer's estimate for the formation of the roads, £59,000; architect's estimate for acquiring the property, after deducting recoupment, £1,414,000—making together £1,473,000. This is said to be an outside forecast of cost; but our experience of Parliamentary estimates is that the outlay almost invariably exceeds them. The Council will further consider the reports at their next meeting. An examination of the proposals, with the aid of a large-scale map, shows that they will effect, if adopted, great and long-required improvements, and there will probably be little difficulty in obtaining Parliamentary sanction for the scheme.

At University College, Gower-street, N.W., a course of six lectures on "Applied Art" is to be given on successive Tuesday afternoons at 5 p.m. by Mr. Hugh Stannus, F.R.I.B.A. The topics to be treated are the distinction and application of ornament with reference to surface, material, construction, and purpose, and the first of the course will be delivered on Tuesday next. The lectures will be given in the library of the Slade School, and are open to the public without payment or tickets.

A meeting of subscribers to the testimonial to Sir C. T. Newton will be held at 22, Albemarle-street, on Tuesday afternoon next, at 5 p.m., for the purpose of presenting the testimonial to Sir Charles Newton, who is about to leave England for some months. The Earl of Carnarvon, as chairman of the committee, will preside. The sum raised hitherto amounts to about £430. Of this about £150 will be required for the bust by Sir J. E. Boehm, which it is intended to place in the British Museum. The balance, after paying expenses, will, by Sir Charles Newton's particular request, be devoted to the establishment of a prize in connection with the British School at Athens.

Mr. Robert Paterson, the City Assessor of Edinburgh, died on Saturday morning at his residence, 47, Grange-road. Mr. Paterson was at business on Friday, and on returning home he had a shock of paralysis, which proved fatal. Mr. Paterson was 64 years of age. He served an apprenticeship with Messrs. William Beattie and Sons, builders, of Edinburgh, as a joiner, in order to obtain the practical knowledge requisite for the profession of an architect. His father was the first assessor for Edinburgh under the Lands Valuation Act, and on his death Mr. Paterson succeeded to the duties of the office, being then twenty-one years of age. He had thus been City Assessor for the long period of over forty years. In 1872 he was joined in partnership by his son, Mr. Robert Paterson, jun. He leaves a widow and five sons and two daughters. At the present time the Calton Convening Rooms are being fitted up for the better accommodation of the staff of the City Assessor, and these alterations were being carried out under Mr. Paterson's supervision.

Four oil-paintings, three by Flemish artists, the other by a Spaniard, have just be added to the collection in the National Gallery. The principal one is a large "Assumption of the Virgin" by Valdez Leal, a Sevillan painter of the latter half of the 17th century, strongly influenced by Murillo. Portraits of the donator and donatrix appear on either side of the picture; the former of these affords a curiously perfect type of the Spanish hidalgo of the time. Another addition is a curious "Interior of a Picture Gallery," attributed, probably correctly, to Jan Breughel, called Velvet Breughel. Its chief interest lies in the remarkable splendour and beauty of the costumes and in the untiring skill with which these are depicted. A third acquisition is a large "family group" by Jan Van Bylert, or Bijlert, of Utrecht. A fourth addition, a "Convivial Piece," is by Hendrick Gerrit Pot—the Henri Pot by whom there is in the Louvre a curious small full-length of Charles I. It is painted in the style of the conversation pieces of Dirk Hals and Pieter Codde, with less sharpness of execution. The contemporary copy by Gerrit Landens of Rembrandt's great "Night Watch" at Amsterdam has been brightened by the removal of the yellow varnish, furnishing additional proof that the original represents a day and not a night scene. This copy furnishes evidence of the mutilation undergone at some period by Rembrandt's great canvas.

The Camera Club in Bedford-street, Strand, have now on view the fourth of their "One Man" photographic exhibitions, and thereby have brought together a very admirable collection of pictures by Mr. H. P. Robinson, of Tunbridge Wells, representing examples of his highly artistic work extending over many years from the earlier days of photography. The subjects of these prints are mainly composed of Rural scenes, such as "Home from the Hayfield," with groups of women and children backed by a sunset. Some of the other studies of figures also show marked ability of the artist and his clever management of light and shade; but death scenes, such as the "Passing Away of the Soul," if highly dramatic, are scarcely pleasing—especially in a photograph wherein if the whole thing is not a sham (which would certainly be in questionable taste), the untimely occasion for the taking of a photograph is at once manifest, and suggests an outrage on the sacredness of the death-bed. Of course, this objection does not alter the merit of the photograph as such, and we admit the cleverness exhibited. Mr. Robinson's cloud effects are wonderfully good, and show considerable reason for the claim made by photographers now for their art as to its pictorial possibilities, hitherto generally denied it. This series serves to bring forward some examples of the best that has been done by the camera, and the exhibition is open free to the public. Evidently the Camera Club is doing useful work. We wish their exhibition-room in Bedford-street had better light.

An address on "New Art in Life" was given by Prof. Baldwin Brown at Edinburgh University on Thursday last as one of the University gathering lectures. Mr. Baldwin Brown drew a distinction between art which is alive and progressive, and art which is stagnant, sterile, and dead. So many deeply-rooted human instincts made for art that there had always been art in the world, but art had not flourished in all its forms at the same epochs. Living forms of art were intimately related to the times which gave them birth. Art which only reproduced what had gone before was but matter of convention and tradition. This was illustrated by the painters of the school of Holland, and to Constable and the French school of landscape and figure painters who received their impulse from him. Turning from painting to the arts of decoration, these, he said, would be found to have been alive and genuinely productive in all ages, even from the remotest prehistoric epoch, but to have suffered something like an eclipse during the present century. It was now no longer natural that when a man made a thing he should make it beautiful or interesting. These qualities were something to be ordered and paid for extra, and were generally mere lifeless imitations of the past. There were now, however, signs of a revival of "new life" in these forms of art, due to the movement for the encouragement in our towns and villages of the domestic arts, which did so much in old time to beautify the common things of life. The newly-formed Scottish Home Industries Association was designed to help in this movement. The value of these simple forms of art as elements in the life of the people formed the subject of some concluding remarks.

A curious example of misapplied labour is on view this week at the Municipal Art Gallery at Birmingham in the form of a model to scale of the Town Hall of that city executed in ivory. It has been made by Mr. Philip Barrington, of Barr-street, Birmingham, a rulemaker; it is about 3ft. in length, and has been built from measured drawings of the structure, taken by Mr. Hamlin, of Temple-row, in that city. There are 8,994 pieces of ivory in the model, corresponding to the stones of the actual building; but, including screw-pins and nuts, metal castings, dowells, &c., the work is composed of 25,310 pieces.

For the protection of the trade, the London Central Association of House Decorators and Painters have just appointed a select committee to inquire into the rate of wages paid by the contractors for School Board work in the metropolis. The Committee have already received a large number of letters from men who have been employed on such work, which has proved the necessity for this inquiry by a trade union the men can trust with the information. They now invite all those men who have worked on School Board jobs to write to them, addressed to Mr. E. W. Blades, the chairman of the Committee, "City of Hereford," Cleveland-street, W., stating the rate of wages received by them and the firm they worked for. The names and addresses of correspondents will be kept strictly private if so desired.

A public meeting in connection with the Plumbers' Company's movement for the national registration of plumbers was held on Monday night in the Masonic Hall, Edinburgh. Sir Alexander Christison occupied the chair. The secretary of the Edinburgh and East of Scotland District Council, Mr. James Rennie, read the annual report, which stated that the registration committee had enrolled 33 masters and 112 operative plumbers, of whom 15 of the former and 70 of the latter were in Edinburgh. The funds of the Council showed a credit balance of £89 5s. 8d. Dr. Littlejohn moved a resolution commending the movement for the technical education and national registration of qualified plumbers as worthy of the sympathy and support of the public. He said he was proud to think that bad plumbing would be rather difficult to get in Edinburgh nowadays. Plumbers must, however, by careful education in the technicalities of their trade and by registration, fully vindicate and assert themselves. It was by such means that quackery in the surgical profession had been overcome, amid considerable opposition from the class interested in the old order of things. The Rev. Dr. Masson seconded the resolution. Professor Crum Brown moved that the meeting strongly approve of the proposal to encourage classes for the technical instruction of plumbers and the promotion of the higher education of persons following the trade or craft of plumbers Principal Grant Ogilvie seconded the resolution. Mr. W. R. E. Coles, of the Worshipful Company of Plumbers, London, said there were now 5,000 members enrolled in the Society, and he had application from all our colonies for duly qualified and registered workmen. The resolutions were unanimously carried.

The two reports for the last official year on the working of the forestry departments of Upper and Lower Burmah just issued speak of great improvement in every direction. The area of reserved forests in Lower Burmah was increased by 200 square miles, and within the present year it will be increased by 400 square miles in the Pegu district alone, where at the close of last year the total area of reserves was 3,318 square miles, and in other districts new reserves are

being formed, or old ones being increased. In Upper Burmah the forest officers are acquiring a full knowledge of the vast areas under their charge, and the difficulties respecting the obligations of the late Burmese Government in regard to forests are being overcome. In Upper Burmah the valuable forests are being worked by lessees, the Bombay and Burmah Company alone holding seven forest tracks. The contracts between this corporation and the Government of India are set out in an appendix to the report. The general work of the department at present is confined mainly to surveying and mapping. The forest laws are little understood as yet by the people, and they are only enforced in the case of serious offences. The amount of timber extracted from the forests is increasing. In 1887-8 it amounted to 98,470 tons, and in the past year to 162,458 tons.

The School of Art Wood-Carving, City and Guilds Institute, Exhibition-road, South Kensington, has been reopened after the usual summer vacation, and we are requested to state that one or two free studentships in both the day and the evening classes are vacant. These studentships are maintained by means of funds granted to the School by the City and Guilds Institute. To bring the benefits of the school within the reach of artisans, a remission of half fees for the evening class is made to artisan students connected with the wood-carving trade. Forms of application for the free studentships, and any further particulars relating to the School, may be obtained from the manager.

The New Hotel Métropole now being erected opposite the pier at Brighton is to be fitted with a complete system of elevators, consisting of two suspended hydraulic passenger lifts, each to raise eight persons, and running from basement to the sixth floor, a height of 96ft., the cars being raised by four steel-wire ropes, and fitted with special patent safety apparatus and governor gear; one hydraulic luggage lift, five hydraulic service lifts, one hydraulic kitchen lift, two direct-acting basement lifts, four hand-power dinner and service lifts, and one hydraulic cellar lift of special design from cellar to yard level. The hydraulic lifts are to be worked by water from a tank at the top of the building, which will be delivered into the tanks by two double-cylinder direct-acting steam pumps, with all the necessary pipes and connections. The whole of this plant will be constructed and erected by Messrs. R. Waygood and Co., of Falmouth-road, London, S.E., who are also erecting hydraulic passenger and service lifts at the Hotel Métropole, Monte Carlo, which is to be opened shortly.

The Pearl Life Assurance Company's (Limited) annual report presented at the twenty-fifth annual general meeting states that 388,313 policies were issued during the past twelve months, representing a new annual premium income of £155,263 19s. 3d. The total income for the past financial year amounted to £252,935 17s. 8½d., and exceeded that of the previous year by £13,522 12s. 9d. The premium income on the policies in force on the Company's books at the termination of the financial year ending in June last amounted to £279,212 12s. 5½d., which, it may be confidently hoped, will be well sustained during the present year. The Company has paid 14,180 claims and grants during the preceding twelve months, amounting to £94,116 5s. 5½d., which, added to the sums previously paid in claims since the establishment of the Company, makes a total of £673,305 11s. 0d. The life assurance fund has been increased during the present year by £32,840, being nearly 33 per cent. greater than the increase of the previous year. The assurance fund, with capital paid up, now amounts to £210,428 5s. 7½d.

A new mission church is being built at Brindley Ford, Staffs, and the corner stone was laid on Saturday afternoon. The site has been given by Lord Sidmouth, and the building is being erected by Mr. Cope, of Tunstall, from the plans of Mr. A. R. Wood, borough surveyor of that town. The building will be 50ft. long by 25ft. wide.

The city council of Manchester have decided, on the representation of Dr. Tatham, their medical officer of health, to remove as an "unhealthy area" within the provisions of the Artisans' Dwellings Acts, an oblong block of properties in Lower Ancoats, bounded by Oldham-road, and Bengal, George-Leigh, and Cornwall-streets.

MEETINGS FOR THE ENSUING WEEK.

Monday.—Royal Academy Lectures in "Anatomy," No. 3, by J. Marshall, F.R.S. 8 p.m.

Tuesday.—University College, Gower-street. Free Lecture on "Applied Art," by H. Stannus. 5 p.m.
Sanitary Institute, "Drainage and Construction," by Prof. H. Robinson. 8 p.m.
Glasgow Architectural Association, "Recent Developments of Architectural Design," by D. Thomson.

Friday.—Architectural Association, Address by the President, Leonard Stokes. 7 p.m.
Royal Academy Lectures, "Anatomy," No. 4, by J. Marshall, F.R.S. 8 p.m.
Sanitary Institute, "Ventilation," by Sir D. Galton, F.R.S. 8 p.m.

Architectural Association, 9, Conduit-street, W.—The Annual General Meeting will be held on Friday, 18th October, at 7 p.m.

Trade News.

WAGES MOVEMENTS.

London Cabinetmakers.—A mass meeting, convened by the West-end branch of the Alliance Cabinetmakers, was held on Sunday morning in Beaumont-place, Euston-road, for the purpose of obtaining the opinion of cabinetmakers as to an increase in wages and the shortening of working hours. Mr. B. Forsyth occupied the chair, and mentioned that only one in 32 of the 40,000 cabinetmakers were at present members of the Alliance, and consequently the true position was worse than that of the dock labourers. Mr. W. Parnell, secretary of the West-end branch of the Cabinetmakers' Alliance, stated that they had upon their books some 33,000 working cabinetmakers, but only 1,000 of that number were enrolled as members of their union. It would be found that when a full week had been put in the average wage was not more than 3d. or 4d. per hour. The proper pay for skilled mechanics was 9d. and 10d. per hour, and he asked them whether they were content to go on with their miserable pittance? Were they satisfied to contiue in slavery and bring themselves into an early grave by the sweating which was being carried on by such firms as Maple and Co. and Shoolbred? Well, then, they must organise themselves, and by combination, and, if need be, by a general strike, get their grievances redressed. He then spoke of the sweating done under the "lumping" and piece-work system. Scores were working over 80 hours per week and in fever dens of the worst character. He urged those present to at once give in their names to the Alliance Cabinetmakers. By entering their union and contributing 4d. per week, that would entitle them to a guinea a week whilst on strike, so that they would not lose much by having a rest. In another section, by paying 2s. a week they would be entitled to greater benefits. A resolution, stating that that mass meeting of cabinetmakers recognised the evils which existed in their trade and of the extraordinary sweating carried on, and pledged itself to organise, by union and strike, to remove those evils, having been moved by Mr. W. Parnell, and seconded by Mr. J. Walker, was carried unanimously.

The Slate Quarry Syndicate.—Negotiations are progressing for the acquisition and working by a syndicate on the same lines as the Cheshire Salt Union of a number of the slate quarries in Carnarvonshire and Merionethshire, and several proprietors of the smaller quarries have given their adhesion to the proposal. The principal quarries at Llanberis and Bethesda are not likely to join in the combination. At the former trade continues brisk, but at the latter the weekly working days are limited to five, and the men complain about the low rate of wages.

The city council of Liverpool have accepted with thanks as gifts from Mr. J. A. Picton, M.P., and as memorials of the late Sir James A. Picton, F.S.A., F.R.I.B.A., a marble bust of the deceased, the silver trowel presented to him on laying the foundation stone of the Picton Reading-Room, and an interleaved copy of the "Memorials of Liverpool," with manuscript notes in his handwriting, intended as material for a third and revised edition. All these will be preserved in the Free Library.

Mr. Cavendish Lemon, of Aberystwyth, has completed a carved oak pulpit, in the Perpendicular style, for Holy Trinity Church, Aberystwyth. The architects are Messrs. Middleton, Prothero, and Phillott, Cheltenham. He has also constructed an Ecclesiastical carved oak cabinet, in the Decorated style, as a present to the Countess of Lisburne on her marriage with Lord Amhurst.

The ventilation of the extensive new watch manufactory, Prescot, has been carried out on Kershaw's system, the patent pneumatic ventilator being adopted for the removal of vitiated air.

CHIPS.

A well-known brewer of Copenhagen, M. A. Jakobsen, has offered to present his large collection of paintings, sculpture, and antiquities to the city on the condition that the Municipal Council will grant a sum of 500,000 crowns for the erection of a new museum. The majority of the committee which was appointed to consider the question has recommended the adoption of the proposal.

The erection of a memorial drinking fountain has been almost completed at the diagonal walk in the West Meadows, Edinburgh, leading from the centre walk to Meadow-place. It stands about 5ft. high, the base being of Peterhead granite and the basin of Aberdeen granite. Surmounting the whole is the figure of a dolphin, from the mouth of which the water will flow. Mr. Alex. Calder, Heriot Hill, was the sculptor.

The newly-published list of members of the Institution of Civil Engineers, corrected to the 1st August last, shows a total of 5,774 on the roll. It is made up as follows:—20 honorary members, 1,667 members, 2,650 associate members, 448 associates, and 989 students. The total shows an increase of almost exactly a thousand during the past four years.

Some progress is now likely to be made at Hastings with the erection of the new workhouse buildings, as, after much controversy and consequent delay, the Board of Guardians have recently adopted the report of the building committee, recommending the plans and general scheme prepared by their architect, Mr. P. H. Tree, at a cost of about £40,000. The plans are to be at once sent to the Local Government Board for approval, and a preliminary loan of £24,000 applied for, in order to commence the work.

François Bossuet, the distinguished painter, died on Sunday at the advanced of 92 years.

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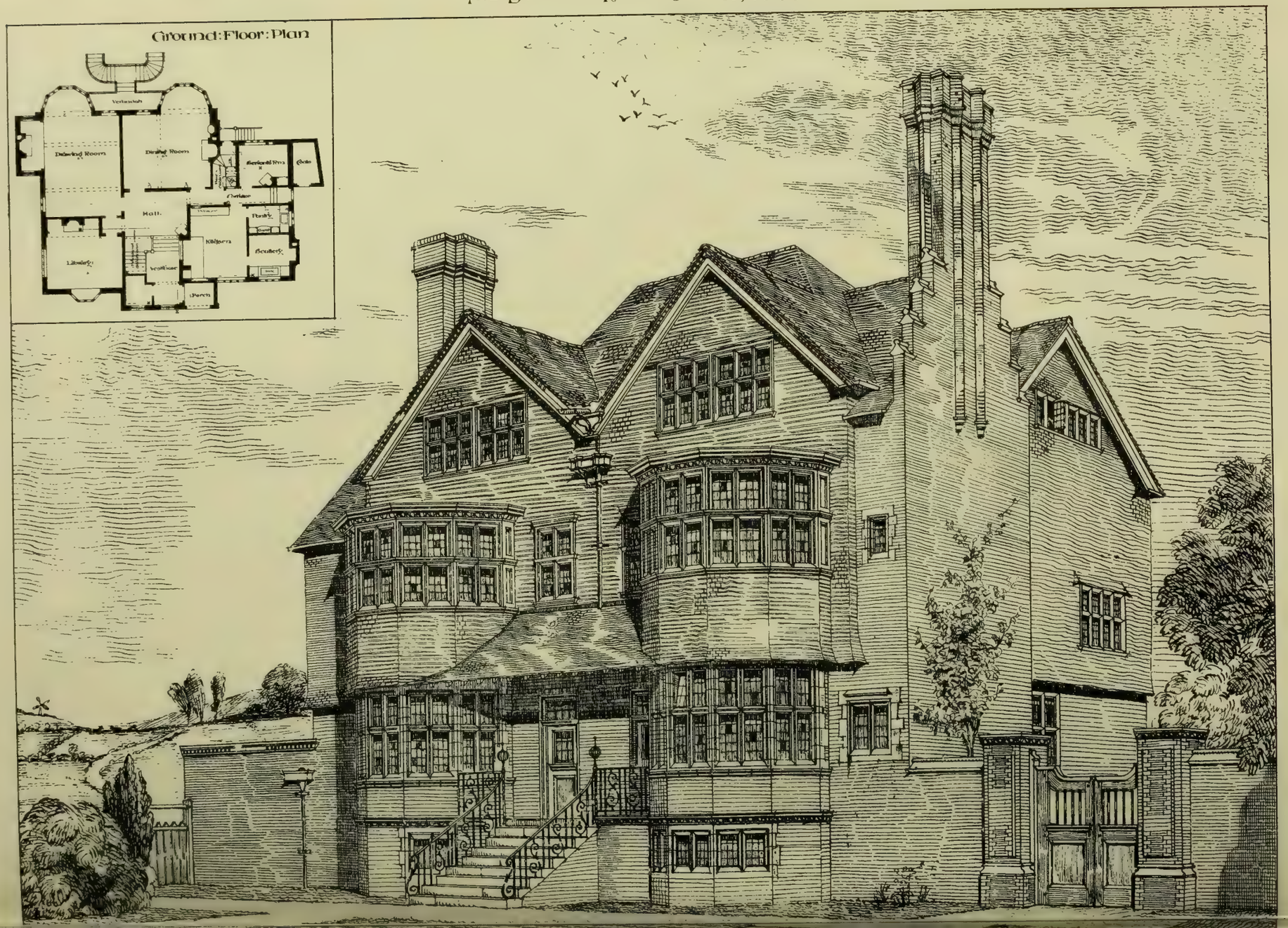
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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

Birmingham.—For the erection and completion of the school in Upper Garrison-lane, for the school board:—
Barnsley, J., and Sons, Birmingham (accepted)... £10,968

Binfield.—For various internal alterations, &c., to Binfield Park House, for Mr. R. Cookson, Worksop Manor, Worksop. Mr. G. W. Webb, A.R.I.B.A., 14, Friar-street, Reading, architect:—
Accepted tenders:—
Water supply, &c.:—Williams and Son, Reading.
General work:—Green, B., Binfield.
Decorations, &c.:—Moffatt, Reading.


Ground: Floor: Plan
Vestibule
Drawing Room
Dining Room
Hall
Kitchen
Porch

REDINGTON LODGE · HAMPSTEAD · N·W· HORACE FIELD · ARCHT

Lodgings for Tutor—University College Oxford

H. Wilkinson Moore Architect



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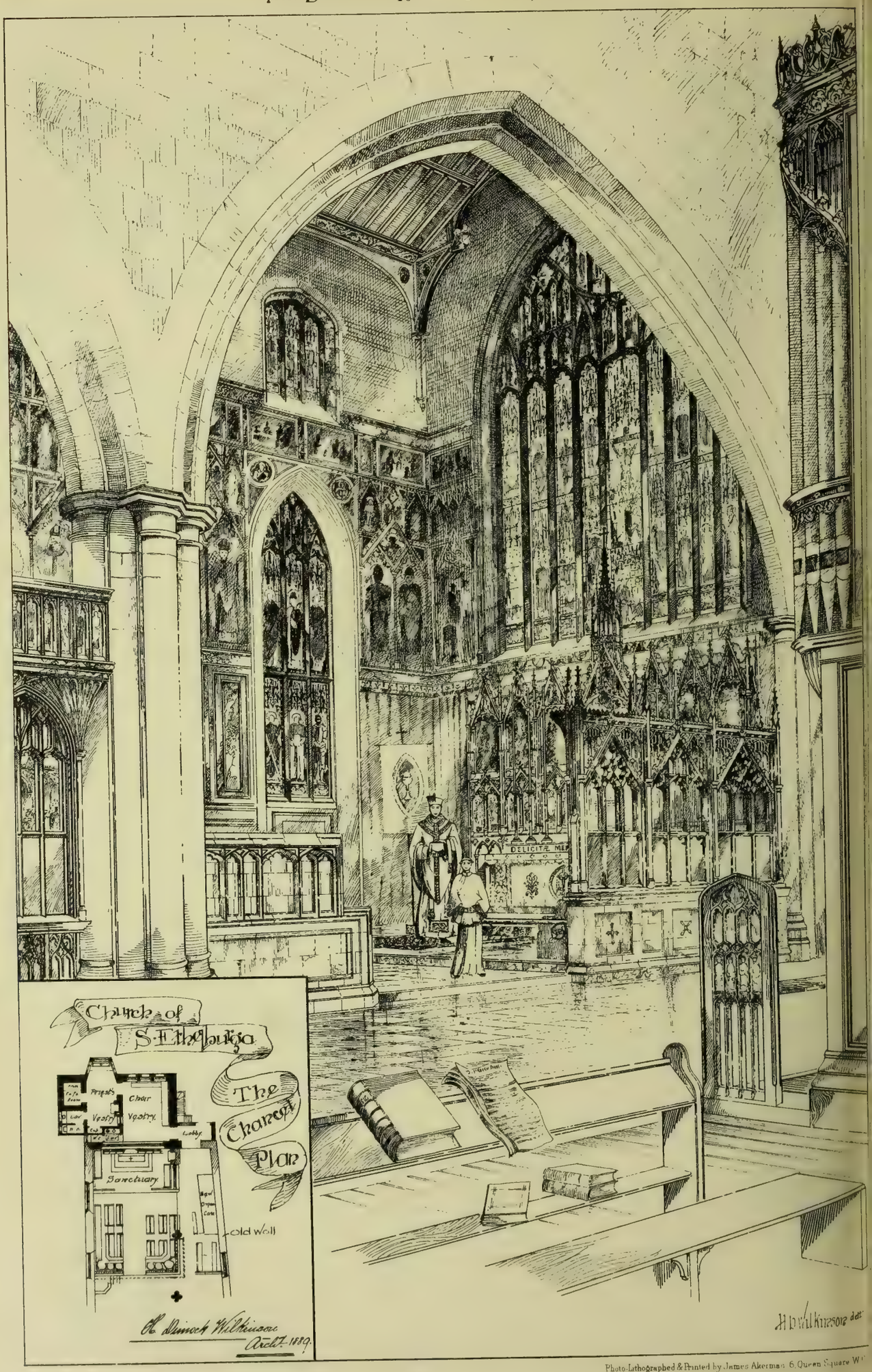


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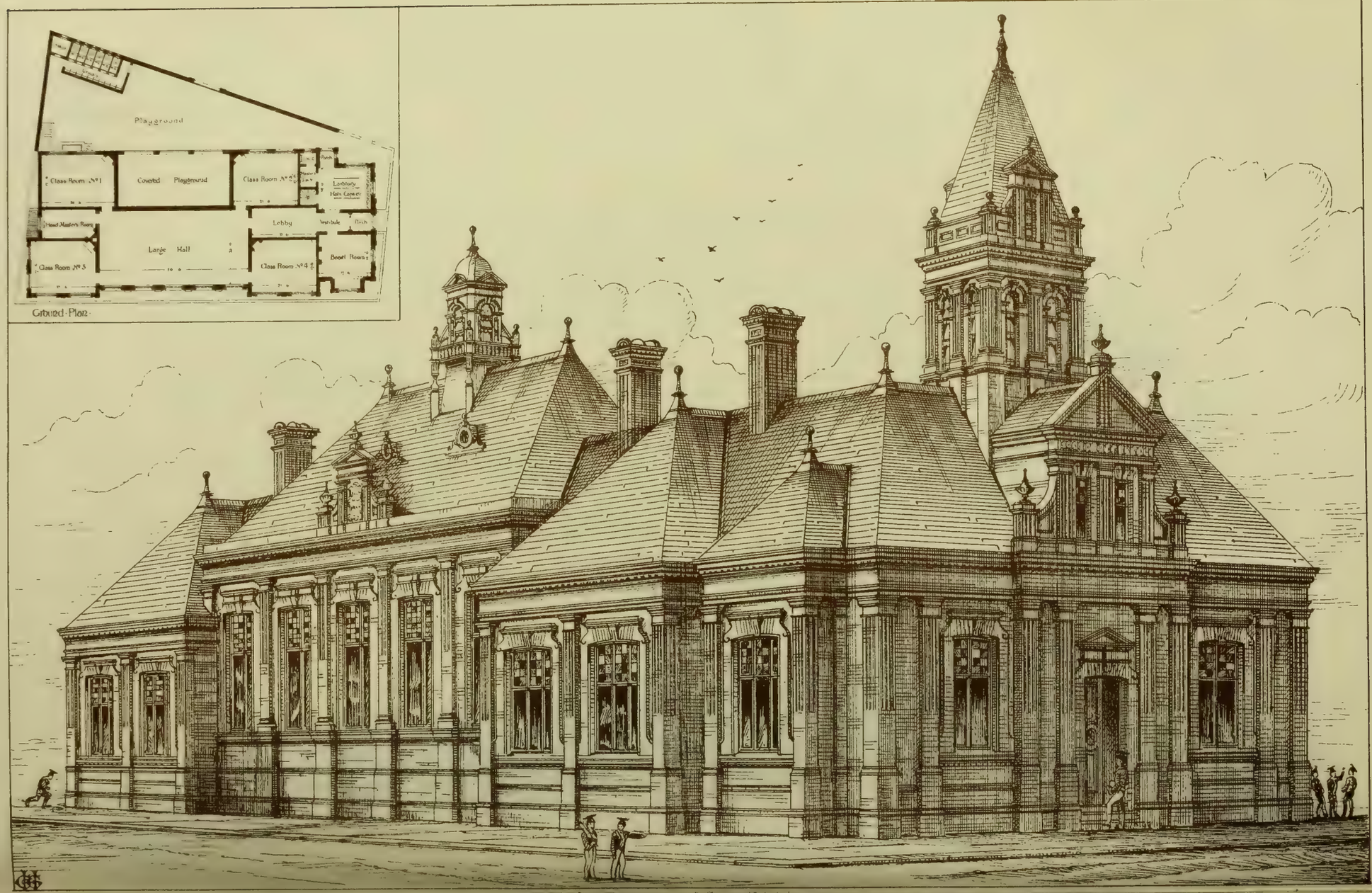
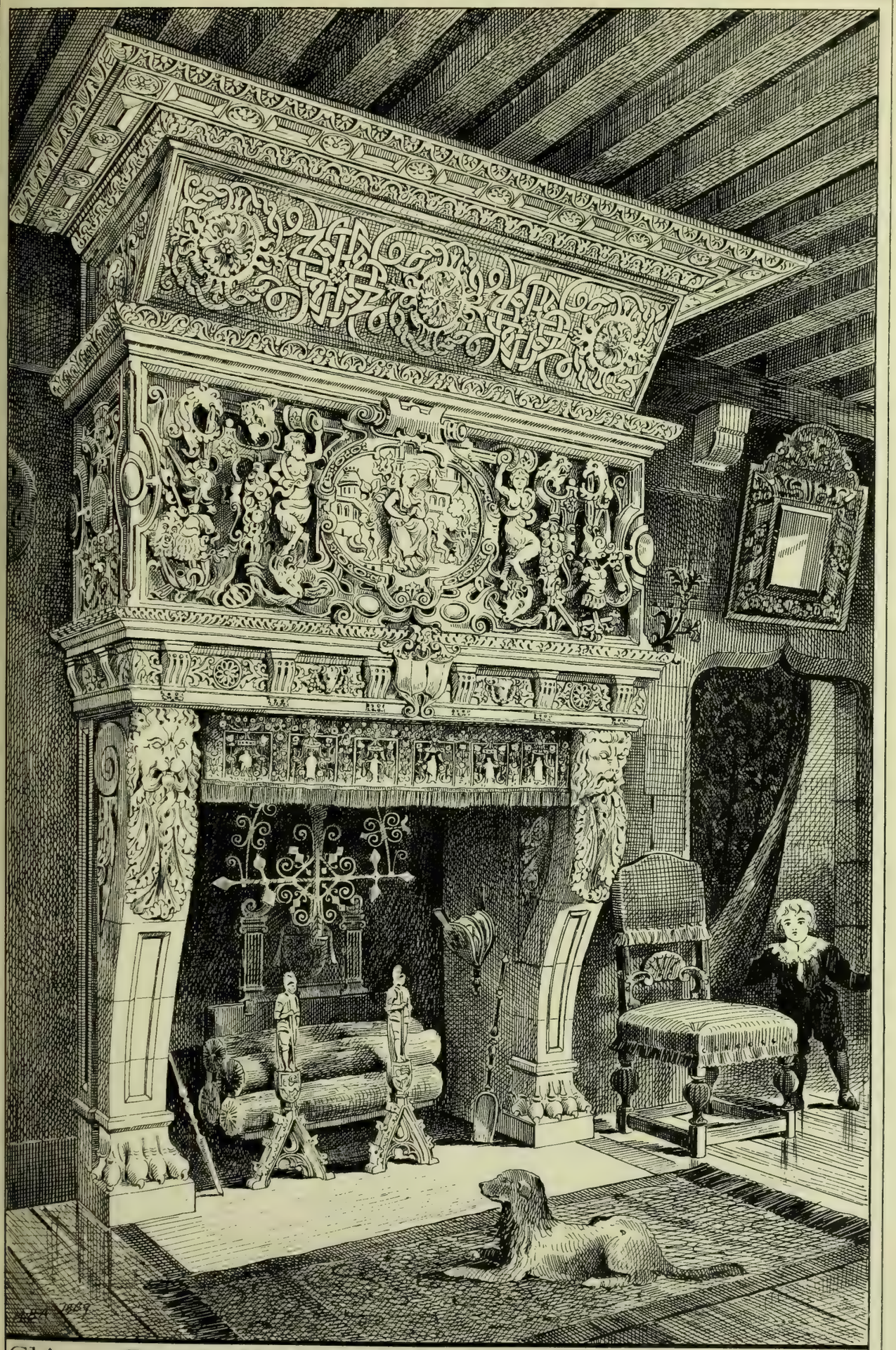

Playground
Class Room N°1
Covered Playground
Class Room N°2
Lavatory
Lobby
Large Hall
Class Room N°3
Class Room N°4
Boot Room
Ground-Plan



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UNION OFFICE HAMBURG. DRAWN BY J. TAVENOR PERRY.

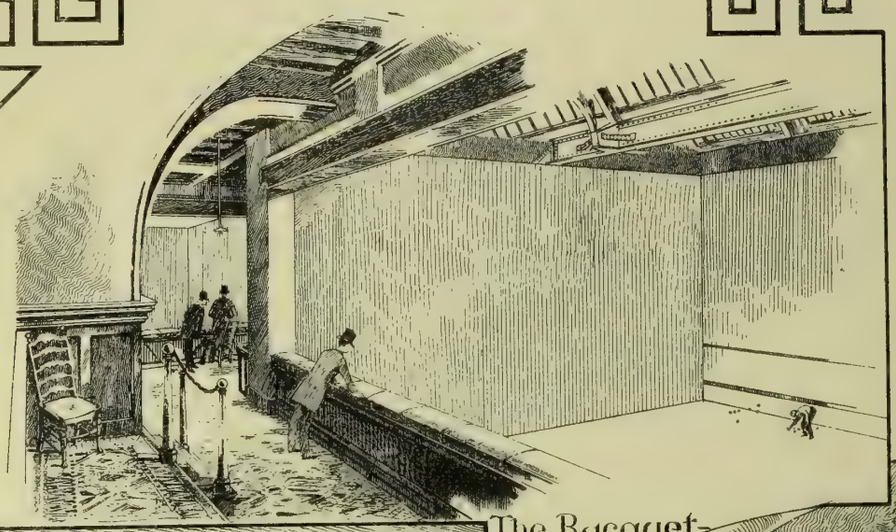


Chimney Piece by Hugues Lallemand, MUSEUM DE CLUNY, PARIS.

DRAWN BY MAURICE B ADAMS, F.R.I.B.A.

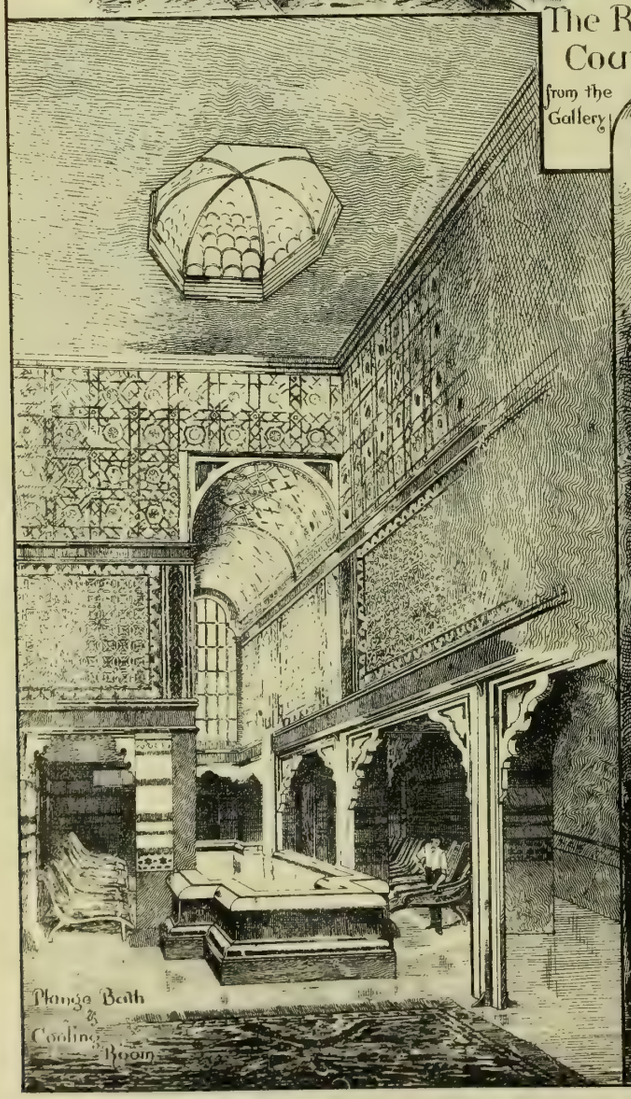
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PRINCE'S RACQUE

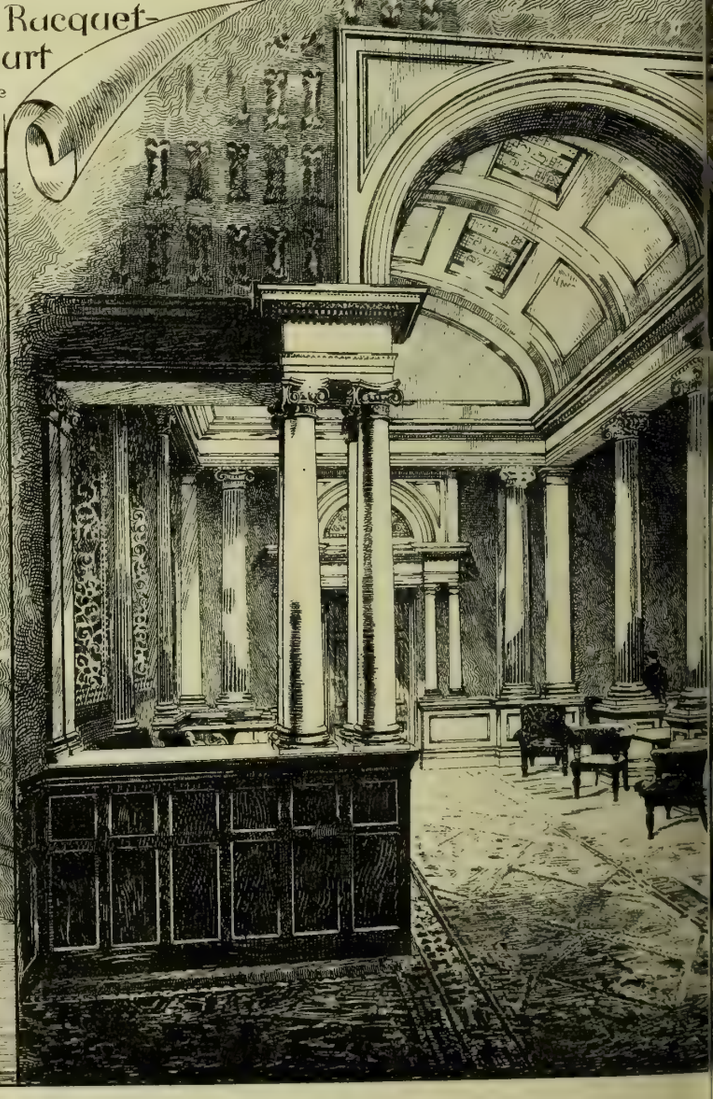


The Racquet-Court from the Gallery





Plunge Bath & Cooling Room



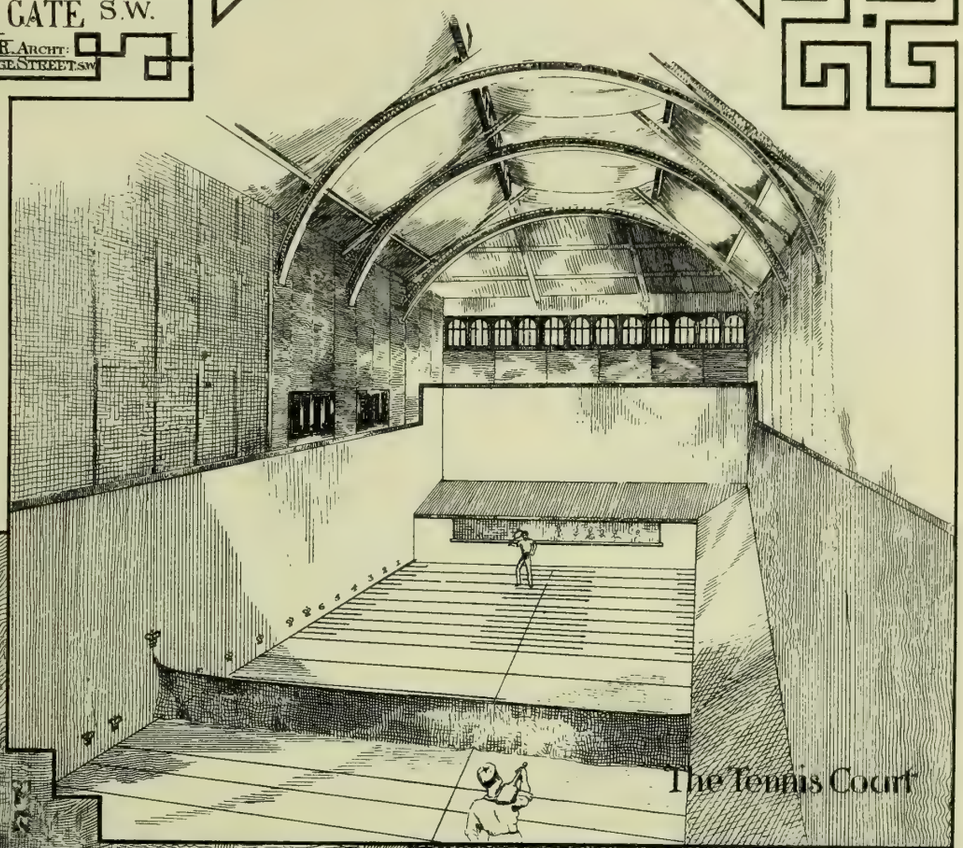
Tennis Club.

Albert Gate, S.W.

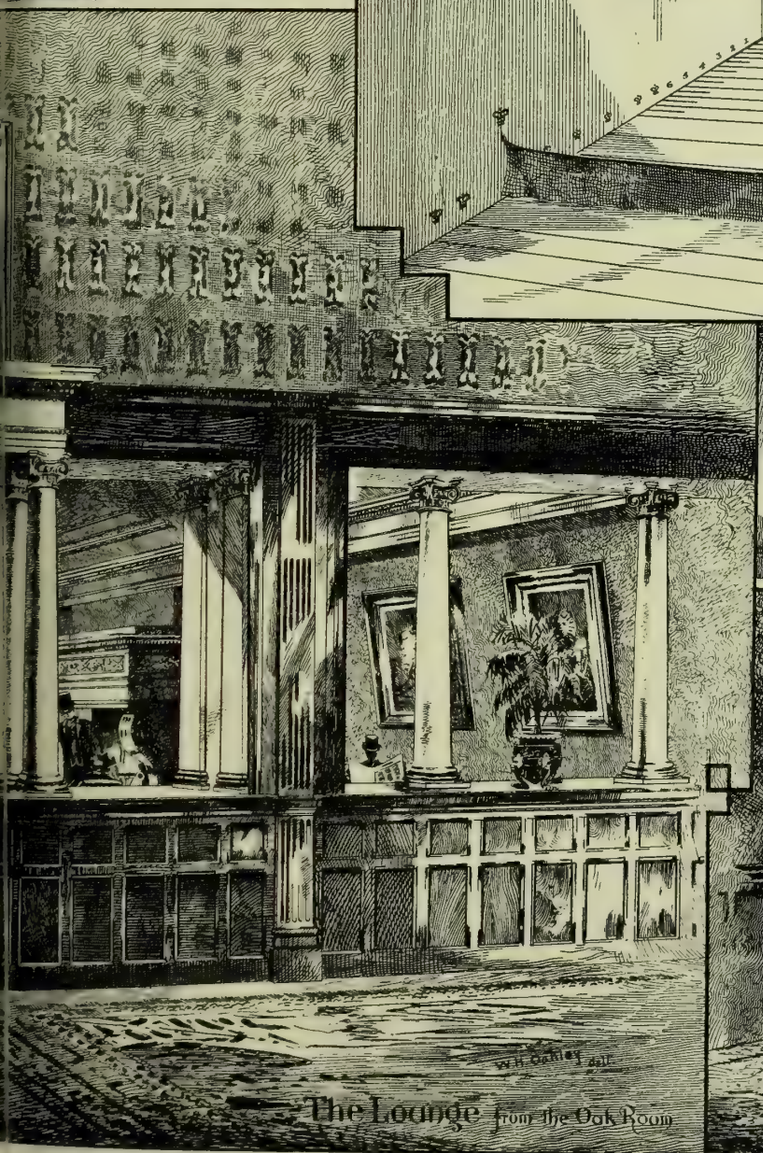
E. H. Bourchier, Archt: 32a, Great George Street, S.W.



The Oak Room.

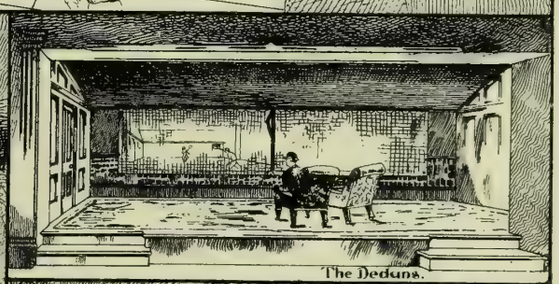


The Tennis Court

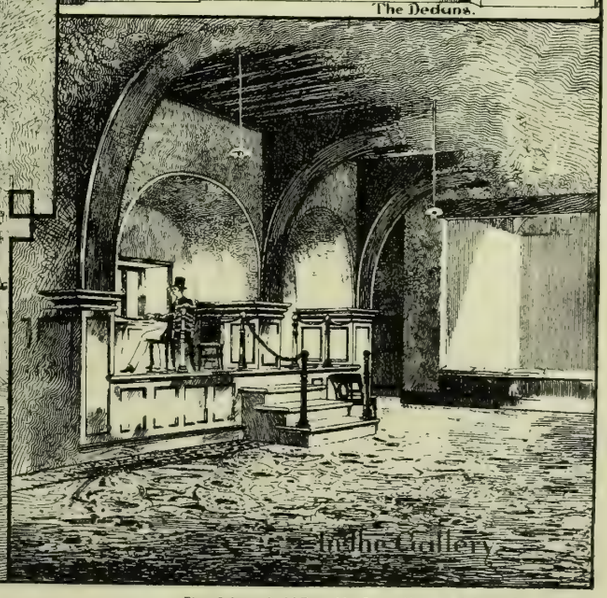


W. H. Gabriel del.

The Lounge from the Oak Room



The Dedans.



In the Gallery

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PALAZZO PUBBLICO AND TOWER DEL MANGIA · SIENA

"PHOTO-TINT" by James Akerman & Queen Square London W.

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1815.
FRIDAY, OCTOBER 18, 1889.

REPORT OF THE SELECT COMMITTEE ON WOODS AND FORESTS.

(*Concluded.*)

CROWN work, according to the Minutes of Evidence taken before the Select Committee, entails an immense amount of labour in the receipt of rents and the management of the agricultural properties of the Crown. There is a large staff of agents, and surveyors, and bailiffs. Following the evidence given by members of Messrs. Clutton's firm, a large staff of clerks, which costs £3,000 annually, is engaged in different kinds of work, and comprises a number of practical surveyors. The object of the committee seems to be to obtain the profits made out of the management of these estates. The office expenses are, it is stated, apportioned upon the basis of the work which is done by the office as a whole, and according to this estimate Messrs. Clutton get no more than £1,000 a year profit out of these properties. In answer to a question by the chairman whether they would object to an arrangement which gave them a salary of £1,500 a year and provided them with all the clerical staff, the reply was, "Certainly not." This answer is rather modified at another meeting. While asserting that such a salary would be better financially, the firm does not approve of such a principle being applied to their agency. Messrs. Clutton are largely engaged in other estates, and carry on the business of land-agents for the Ecclesiastical Commissioners; they collect the rents, which amount to a very large sum, over the South of England, and practically over the same district as that of the Crown. In apportioning the working expenses, the two offices have to be kept distinct. It is not easy to say how much of the firm's time is taken up with the Crown and how much with other business, seeing that the former is only an item in the work of the establishment. This firm supply all the sub-agents, surveyors, and engineers in the supervision of farms, unlike other agents of noblemen, who get a fixed income, the owner supplying the staff. Our present purpose is not to inquire whether the arrangement of supplying all labour of every kind is desirable. For many reasons it is better that the general supervision should be intrusted to one perfectly free and independent of the working staff. We are sure that the plan of preparing a scheme and carrying it out is less likely to give satisfaction: it entails a large and complicated staff, a number of clerks and book-keepers, the machinery of which is complex, and the expenditure great. The control of the mineral property of the Woods and Forests, under Sir Warrington W. Smith, F.R.S., necessitates a large staff, inspection of the working of mines, advising the Commissioners in cases of difficulty, seeing that the terms of the Crown lease are observed. In some instances there are extensive under-sea workings, as in the Northumberland and Durham mines, the Crown owning only the foreshore and under-sea rights. For these duties Sir W. Smith receives £800 a year and 6d. a mile for travelling expenses.

The evidence of Mr. Spencer W. Gore, of the firm of Smith and Gore, land surveyors, one of the receivers, if of some interest. We learn that 21,000 acres are under his charge, agricultural land chiefly, and the rental is about £29,199. The remuneration varies from 2½ to 4 per cent., besides other emoluments for drainage and carrying out buildings. The duties are to receive rents, manage the estates, arrange tenancies, look after repairs, and settle disputes.

Sir Robert Nigel FitzHardinge Kingscote's examination deals with the manner drainage work is carried out. Mr. Clutton, senior, examines the site, decides what is to be done, and sends down Mr. Grantham, engineer, to make estimates, take levels, and prepare a plan. After the Commissioner gives consent to the estimate the work is commenced, a foreman is appointed, and the work of cutting is done by labourers, who are paid by piecework—so much depth, and so much length. In building the work is done by contract, though this witness thought that tenders would be desirable where several could be obtained, and he spoke strongly in favour of tendering.

Mr. Arthur Cates, the architect and surveyor of the Crown Estates in London, gave some valuable evidence. He was appointed to succeed to the duties of Mr. Pennethorne. The duties, briefly, comprise letting houses on repairing leases, advising as to the re-letting of houses the leases of which are about to expire, making surveys and valuations of them, negotiating with tenants, settling agreements for letting, advising on drawings and specifications submitted, superintending repairs, certifying as to expenditure and execution of work to entitle lessee to the grant of lease, &c.; advising as to building sites, the necessity of pulling down old houses, clearing sites and letting for new buildings, advising on designs submitted for them, superintending the new buildings, reporting on completion, making surveys, and conducting all negotiations. Other duties comprise the sale of old materials and fixtures, the sale of properties, valuing them, attending arbitrations, and supporting Crown valuation; the purchase of property in London, ground rents, &c. The scale of charges agreed to on appointment to the office is one of the documents handed in, and as this scale is of interest, we give it:—

	For a single house and offices, and a stack or range of buildings.			For any additional number of adjacent houses or buildings comprised in the same survey and not exceeding nine each.			Add for any additional number of such houses or buildings.		
When the computed net yearly rent at which the premises shall be let by the Crown shall not exceed £50	£ 9	s. 9	d. 0	£ 5	s. 12	d. 0	£ 4	s. 14	d. 6
Shall be above £50 and not exceed £100	10	10	0	6	6	0	5	5	0
£100 ,, ,, £200	13	13	0	8	5	0	6	14	6
£200 ,, ,, £300	16	16	0	10	3	0	8	8	0
£300 ,, ,, £400	18	18	0	11	11	0	9	9	0
£400 ,, ,, £500	21	0	0	13	0	0	10	10	0
£500 ,, ,, £750	26	5	0	—			—		
£750 ,, ,, £1000	29	8	0	—			—		

This scale is (1) for surveying, valuing, and reporting particulars of houses and buildings in London proposed to be granted on repairing leases, for revising and reporting, arranging terms, and making any plans, &c. (2) When the houses are found to be unfit to be granted on repairing leases. For surveying buildings and ground, valuing new sites, and preparing designs and estimates required, negotiating for leases, advising, setting out work and superintending, and other necessary labour, a compensation equal to one-half of the sums reserved to the Crown as the full yearly rent of the premises is allowed, one moiety to be payable on the execution of agreement, the remainder on the execution of the lease. (3) For valuing fixtures and materials of buildings proposed to be pulled down, selling the same by private contract or tender, and superintending removal, a compensation of £5 per cent. on the net proceeds of sale; when sold by auction 1¼ per cent. For preparing reports, plans, designs, specifications, and estimates, and all necessary working drawings for buildings executed at the expense of Crown, advising on contracts, superintending the erection, examining artificers' bills, and for all other business incidental to the service, a commission of 5 per cent. on the amount of expenditure is allowed; this to include a set of drawings for deposit. (4) For superintending the execution of repairs, and certifying that the amount agreed to be expended by the lessee has been laid out, there is allowed, when the sum expended shall not exceed £200, 2 per cent.; when above £200, but not exceeding £1,000, 1½ per cent.; above £1,000, 1 per cent. Then follow a scale of fees for valuation, to which we need not refer. Mr. Cates's statement to the Chairman of the fees which he has received in connection with Crown property under Col. Kingscote's charge are given for each year from 1880 to 1888, from which we see the very fluctuating character of them. The highest year was 1884, when the receipts reached £5,809; the lowest last year, when the income was only £2,166. These figures include certain fees payable upon the grant of building leases by the lessees; but the actual bills represent rather less amounts. The payments made by the lessees are under a clause in the building agreement, which provides that, upon the granting of a certificate that the lessee is entitled to his lease, and the contractor is to pay to the architect of the commissioner a fee equal in amount to the fees payable to the district surveyor under the Metropolitan Building Act. A portion of the amounts paid the architect are a net charge on the land revenues. The architect has no power to enter into a building agreement, as the acceptance and formal agreement of leases are carried out by the Office of Woods. Repairing leases are granted for 21 years, but where the expenditure upon the buildings is considerable, the length of term is sometimes 40 years. Sites let on building leases are let on a term of 80 years. The longer term brings a rather higher rental. In answer to other questions, Mr. Cates says there have been large additions to the capital account by the purchase of new property. It is interesting to note the fact that between 1873 and 1889 £1,396,700 has been expended in London in purchasing freehold ground rents, producing £53,820 in annual rent, giving an average of just under 26 years' purchase. During the same period the total cash received for sales in London property has been £226,823. The amount payable to the Crown for the Spring-gardens site is paid by half-yearly instalments of about £8,000 a year, and out of £324,878 payable under that award only £35,224 has been received, so that there is a balance of £289,653 capital yet to be received in respect of the Public Offices Site. The sales to the Ecclesiastical Commissioners and to the trustees of certain charities are made on a valuation by Mr. Cates, under a form of declaration of the full market price of the property. In further examination this witness says that the cardinal principle in dealing with houses to be let on repairing leases is that the occupying tenant should be the person to be negotiated with. Mr. Cates says his staff and expenses cost something like £1,000 a year, and he thinks that the terms of his appointment are more advantageous to the public than those of a salaried public servant, as it leaves the control of the surveyor in the Commissioners' hands.

Describing the income-producing estates of the Crown in London, Mr. Cates refers to Kensington Palace Gardens as the

first, commencing on the north in the Uxbridge-road, in the High-street, Notting-hill, and extending to the High-street, Kensington, including an estate on the south side of that street, on which new buildings were erected; two great houses at Albert Gate, the result of the new entrance to Hyde Park, houses on the north side of Piccadilly between Apsley House and Gloucester House, the Duke of Cambridge's houses on the east side of Park-lane, the Millbank estate extending from Grosvenor-road and the Thames northwards to Vauxhall Bridge-road and Besborough-street; the Regent's Park Estate from the Albert-road on north, to Park Crescent and Portland-place on the south, and from Park-road on west, to Park Village and Osnaburgh-street on the east. This estate includes a small piece of the great bow-window of the Langham Hotel (that hotel being built, not on Crown property, but on freehold); it includes St. George's Hall, property in Oxford-street and Wardour-street; in Piccadilly, property extending from Regent-circus to two houses west of Swallow-street, including St. James's Hall and adjacent buildings. On south side of Piccadilly the Crown property extends from the Haymarket, including "The Criterion" and Museum of Geology, to Church-place, also from Duke-street, including the Egyptian Hall and extending in both blocks to Jermyn-street. Other properties include blocks on the west side of St. James-street, west side of Haymarket, and south side of Pall Mall, and houses on north side, Carlton House-terrace, offices of London County Council, Spring Gardens; Haymarket Theatre, &c. These embrace some of the principal properties. Other smaller properties at the East end are detailed, such as Victoria Park. These Crown properties are classed under—1, The Ancient Land Revenues of the Crown; 2, Properties the result of extensive improvements, such as Regent-street, Charing Cross, &c., carried out by the Crown, by sale and exchange of ancient land revenues; 3, Properties acquired by purchase and exchange. The receiver for Middlesex, Mr. Higgins, says the entire amount of what is received by him for the estates is £250,388, largely derived from ground rents. When the leases fall in this revenue will be very largely increased.

The Crown has acquired property in Victoria-street on both sides, and nearly the whole of the Holborn Viaduct from Hatton Garden to St. Sepulchre's Church, by the purchase of ground rents. Regent's Park, once known as Marylebone farm, is ancient land revenue of the Crown. The plans of Mr. John Nash were approved of for laying out the estate with terraces and villas in the interest of the public and Crown. Other evidence of a general nature fill up the thick blue book which we have no space to summarise here. The evidence of Sir R. N. F. Kingscote, K.C.B., Mr. Gore, Sir W. W. Smyth, F.R.S., is particularly valuable. The appendices in the form of tables of income and expenditure, and particulars of revenue, are important. From the information and facts given, there is clearly room for retrenchment in the cost of keeping in efficient order these estates, and in the reorganisation of some of the departments, there is much that may be done.

LEVELLING.—XXI.

THE PRISMATIC COMPASS—(*continued.*)

FROM our description of the prismatic compass it will have been noticed how a magnetic azimuth of an object is observed, or the horizontal angle between two vertical planes, one passing through the station point and object, the other plane through the station and magnetic meridian. Referring to diagram (Fig. 45) in last article, an azimuth exceeding 180° denotes that the direction of the object to which it is measured lies to the left of the position from which it is usually measured. In practice the two directions noted on the card may be read 22 W. and 35 E. of the magnetic meridian. In traversing a boundary (as in Fig. 47) *a b c*, the line *a b* reads 280°, which, subtracted from 360°, leaves 80° W. as the angle; the line to the right of station reads 80° E. Other uses of this very delicate little instrument will readily suggest themselves, and in filling up the details of a survey it is indispensable. Let us take one simple case.

In determining the position of an object from two fixed points constituting the extremities of a base line measured, as we have seen in speaking of laying down triangles, the prismatic compass may be usefully employed when the distances are not great. The angles can be read as accurately as it is possible to plot them by the protractor on paper. Thus for example, at one extremity of the base line, the object to be fixed lies in a direction east of north and reads on the card 65°. At the other extremity of the base line the direction is west of north, the reading being 335°; then 360° − 335° = 25°, the other angle. These angles of 65° and 25° can be thus set off by drawing the magnetic meridian through each point of base, and with a protractor tick off the angles respectively on the east and west sides of north. If we take the south point of compass, the angles can be plotted conversely on the west and east of south, placing the straight line of protractor to coincide with the meridian line.

Fig. 48

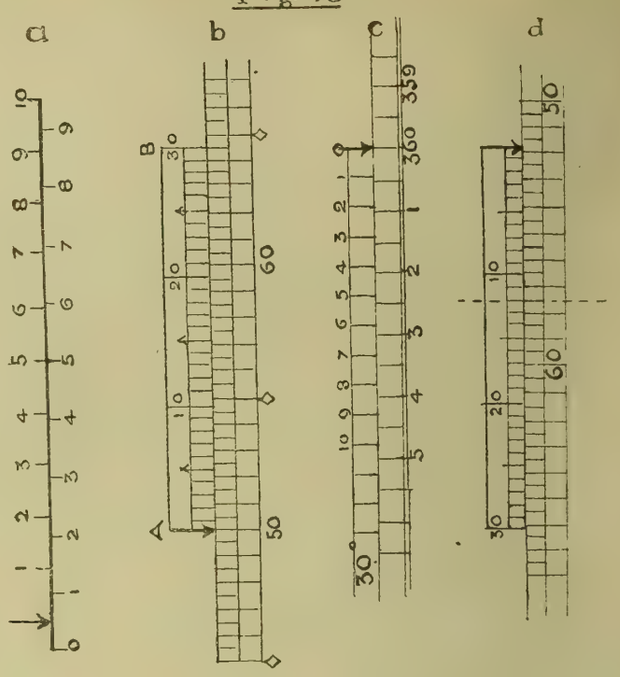
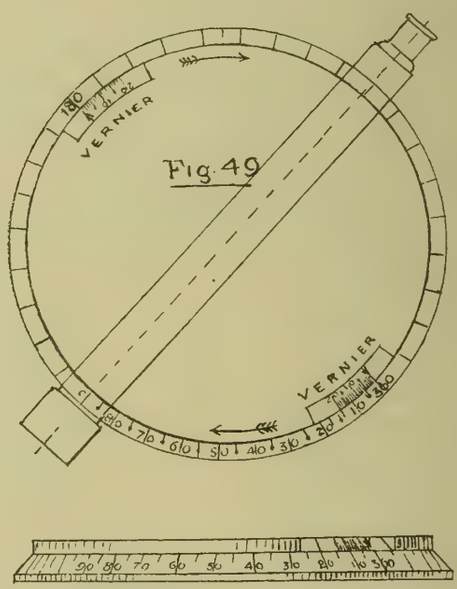


Fig. 49



THE THEODOLITE VERNIER.

The theodolite is pretty well known to our readers, and it is unnecessary here to describe its mechanical construction. There is one point about it which makes it a rather difficult instrument to handle by students—namely, the reading of angles. To do this the verniers which are fixed to the upper plate of every theodolite ought to be clearly understood. As our readers know, the vernier is a scale by which fractional parts of given lengths are measured, or more correctly, for subdividing the equal parts that have been made on a straight line or circle. To exemplify the principle of the vernier, we

may first take the straight form of the scale. The vernier is made to slide along the graduated limb of an instrument, and is of a length consisting of a number of divisions of the primary scale less by one than the number of its smaller divisions. Thus, if we divide a line into nine parts on one side, and ten parts on the other, we obtain a length between the divisions of 1-90th of the whole line. Looking at diagram *a*, Fig. 48, let us assume the upper divisions to be the vernier, and the zero or arrow head be moved as shown, so that the divisions at 5 coincide; then the arrow will have moved 5-90th of the whole length of scale, or half-way from zero to the first division of the primary scale. The same principle is applied to the vernier scales of the theodolite, which are placed 180° apart on the upper plate, as shown in Fig. 49. The limbs are circular instead of straight; the only difference is that the primary scale or lower edge of plate is divided into degrees, and each of these into two or three equal parts representing 30 or 20 minutes; in small theodolites each degree is divided into two parts or half-degrees. Suppose we desire to read minutes. As one minute is a thirtieth part of each subdivision of the primary scale, or lower limb, we take 29 divisions on this scale, and divide this length into 30 equal parts on the vernier. Our diagram (48) is not sufficient in length to show the graduations, but will indicate the manner of dividing 29 divisions of the lower scale, being divided into 30 parts in the upper or vernier scale, of which we have only shown 10. As each of the lower divisions is equal to half a degree, we get $\frac{1}{60}$ of a degree by the vernier. For if $m + 1 = 30$, $m = 29$, the product $\frac{1}{m(m+1)} = \frac{1}{29 \times 30} = \frac{1}{870}$ of the whole length of the 29 divisions, and these being half-degrees, $\frac{1}{870} \times \frac{29}{2} = \frac{1}{60}$. Diagram *b* shows a complete vernier divided into 30 equal parts, or its graduation is equal to the 29 divisions in the limb or primary scale. The vernier arrow or zero coincides with 50° of the lower limb, and the 30 divisions of the scale terminate at 64° 30 minutes of the lower limb. It will be seen that not one of the intermediate divisions of the vernier coincides with any of those on the lower scale. When the zero moves ever so small a distance, one of the divisions of the vernier must coincide with one of those on the lower scale. Let us suppose it is moved one division of the lower scale on to 50° 30 minutes—not one of the other lines of division would coincide. If the tenth division coincides with 45°, the reading will be 50° 10 minutes; if the 20th division of the vernier is coincident with any division of the lower scale, it must be at 60°, and the reading is 50° 20 minutes; and if the 30th division of the vernier, or end of scale, is coincident with one of the lower divisions, it must be at 65°. Thus we see that if we move the vernier so that each of its 30 divisions fall consecutively over any divisions of the lower scale, the result is one-half degree only has been moved. If when viewed through the microscope the arrow is found to have passed one of the divisions of the lower plate, which denote half-degrees or 30 minutes, we want to find out how many extra minutes have been passed. We immediately seek for a coincidence in the upper and lower divisions.

Suppose we find that the point of coincidence (Fig. *d*, showing scales magnified) is as represented. In this diagram the dotted line shows the point of coincidence to read 51° and 42 minutes—that is, the arrow has passed the first subdivision of 30 minutes beyond the 51st degree, and there are 12 subdivisions of the vernier to the point of coincidence, making 30′ + 12′ = 42.

HOW TO READ THE VERNIER.

Thus, in order to read a vernier, the eye is first directed to the zero or arrow, to see where it cuts the lower limb. If it coincides with one of the graduations thereon, the reading is that denoted on the division of the lower plate; but if it strikes a point between two divisions, note the next lower division of plate for degree, and look along the left of the zero on vernier till one of its divisions is found that coincides with one on the lower limb, and the reading noted thereby on the vernier is taken to represent the minutes. Thus, if the arrow has passed one of the subdivisions of the lower limb which denotes 30 minutes, that number of minutes is added to the vernier subdivisions from zero to point of coincidence on the two plates. The requirements of ordinary surveys make it unnecessary to increase the subdivisions on the vernier and lower plates, as it is possible to estimate seconds by the eye.

It will be noticed, on looking at the plan of the plates in last diagram, which shows the position of the telescope, that the upper limb or vernier plate travels from left to right, so that the figuring of both the lower and vernier scales reads from right to left, the instrument being worked round with the sun.

THE GROSVENOR GALLERY.

PASTEL drawing or painting bids fair to become a favourite substitute for oil and water-colour with some artists, and the second exhibition of this sort at the Grosvenor Gallery is a sign of the interest taken in the art. For portraiture, still life, and landscape painting, pastes put on dry that can be manipulated by the finger offer many advantages to the painter who wishes to realise effects with little labour of preparation. These crayons can be handled and blended so as to produce the most delicate tints and colours, the most exquisite flesh tints, textures, and velvety shades. They can be applied to paper fixed on canvas without any preparation, and they allow of much variety of treatment. In looking over the fine collection of pastels in the Grosvenor, we are reminded of the wonderful effects that can be produced by the use of crayons, though in many instances we see work that too much resembles in treatment and handling the methods of oil and water-colour, and which a close examination proves to be more worthy of the latter, in which the dry powder is not wholly relied upon, but some kind of vehicle or fixative is employed. They are, in fact, rather water-colour than genuine pastel pictures.

In the West Gallery we have an abundance of portraits of more or less merit. One of the most dashing sketches is the portrait of Hubert Vos (2), by Emile Wawters, a skilled master of pastels in its legitimate sense. The head and shoulders of the young Belgian painter are vigorous, and the light hair and chiaroscuro of the face exceedingly effective. "A Sketch" by Ernest Sichel—a young lady in dark brown sable fur and black hat—is a more finished and oil-like work, yet admirable in drawing and tone. The head of an old woman, deep and unassuaged sorrow being written in her face, by Emile Levy (17), is a strong work, the light and shade being rendered with great effect. Miss Florence Small is an able pastelliste. "The Poet"—a side study of a young girl lost in reverie upon a poem which she is reading—is graceful in pose, and the delicate white dress and background is a treatment that is more in keeping with the pastel than the darker oil-like effects of some pictures. H. Muhrman (18), an "Ice Scene," and James E. Grace, "Sketch"—a delightful autumn woodland—are pleasing studies, showing the suitability of the medium for blended shades and tints. Boldly painted is R. Wane's large coast scene, "An Anglesea Nook"—a headland and bay with craft. The depth of tone and water of this picture are forcible and oil-like. Frank Brangwyn's "October" is a study of sunlight effect in a woodland—a sort of impression that can be well represented in this medium. The seated young lady, "Miss Breul," by Otto Scholderer (25), and Miss Florence Small's "Little Quakeress" (33) are both interesting; the last is a thoroughly pastel-like work in steel grey tones, which is the colour of the little girl's frock, the reflected light on which is cleverly done. J. Nelson-Drummond has a large prominently-hung picture of "St. Paul's, from the River"; the outline of dome and busy craft and warehouses appearing through an atmosphere of mist and smoke, poetical in conception; while below it is a portrait of Mr. G. F. Montfort (37), attired in a dress suit on a lounge, with cigarette in hand, rather commonplace in treatment, but a good example of the oil-like depth of tone and finish that can be reached. St. George Hare, the artist, is a contributor of other remarkable portraits. Arthur Hacker's "Mauve and Gold" (40), a lady attired in a mauve dress holding a gold-knobbed parasol, is a cleverly-handled and more appropriate in treatment. W. Llewellyn paints a fine luminous river scene, full of light (35), and George Wetherbee a "Study for a Picture," poetical in its subject, a shepherd and little girl leading his flock home under a moonlight sky. A large and brilliant coast view by Alfred Hartley (48), J. Milner Kite's "Brittany Barmaid" (51), and a portrait of Mr. C. P. Little, by Mrs. A. Raphael, are worth notice. St. Clair Simmons sends an "Idyll," a beautiful girl, clad in loose drapery, lying in a wood. The face and tresses of long hair and the drawing of figure are excellent. A sunlight sketch of "Children in White," by John McLure Hamilton; "Florence," by Miss Tolhurst; "Etude d'Enfant," by E. Levy; "La Cigarette," by Leslie G. Cauldwell—a clever study of reflection of light on face—and some nice-toned landscapes by A. D. Peppercorn (74—79), soft in the management, may be named. The brilliancy and delicacy of pastel is seen to perfection in the portrait of Mrs. Raymond Radclyffe (77), by W. Llewellyn. This lady is attired in a light blue ball-dress, the texture and finish of which are unsurpassed; a large feather fan is in one hand. The light colouring is well sustained in the silver frame. A masterly study of the female figure is Solomon J. Solomon's "Amazon" (83). The foreshortening of the Amazon is admirable; the flesh-tints and colouring generally resemble oil painting. Next in merit is J. M. Hamilton's "Leisure Hour"—a lady doing needlework. Emile Levy's "Jeune Fille en Costume Japonais" (106) is exceedingly clever and spirited as a study of a little girl in Japanese costume, with a screen background. H. Muhrman's "A Windy Day" (110) is fresh; and at the end of the gallery are two masterly subjects, "Songs of Spain," a dark woman with tambourine, by St. George Hare, and Hubert Vos's "Abdallah" (115), a powerfully-painted figure with dark, downcast eyes. Abdallah was the father of Mohammed, and was reputed a very beautiful man; but it is doubtful whether this subject is intended to represent him. Portraits by F. De Marneff Stark (118), St. George Hare (130)—a smiling face of girl in black hat and fur, a study of girl in field by Geo. Clausen, "Un Gamin" (126), by Mdlle. Anna Bilinska, are among other subjects of interest in this gallery.

The East Gallery is full of portraits. Chas. Vigor's "Mrs. Tennant" (155), a lady in black moiré and bonnet, seated, is naturally rendered. A full length portrait of the

Hon. Hilda Keppel in white, brown background, with a green vase holding sprays of grass, hangs at the end of room, by Ellis Roberts—a delicate work in pastel. St. George Hare has two ladies' portraits; one is seated, dressed in white with open dress. The salmon-tinted background is not a very pleasing colour. Arthur Hacker's "Nerina" (223) is a powerful and vigorously drawn figure, picturesque in the costume, and handled with much poetic feeling. Charles Wilkinson's "St. Ives," a sunset, is brilliant in colour and soft in light. Henry J. Hudson's (166) "Thaisa," Charles Watson's "Fisher Boats" (168), A. Nozai's "Cliff and Sea" (178), Charles Shannon's idealised subject "The Sheep Hear His Voice" (197), Miss Lovering's portrait (200), and G. Gedley's "Phyllis" (203), Arthur Severn's "Cloud Effect" (225), and the works by Miss Ethel Wright (229), are to be mentioned for their skilful handling of the crayon. The portrait of Miss Charlton, by St. George Hare, a seated figure in light blue silk with pink cloak fur trimmed, is too artificial; there is an air of affected pomposity in the pose of the young lady, who is seated in such a regal attitude. The third room shows a very poetically-conceived subject by Reginald Machell, "The Peri at the Gate of Heaven" (277), an angelic female figure surrounded by a radiance of light and colour—an example of the brilliance attainable by coloured chalk painting. Miss Ellen Terry's portrait, by R. Lehmann (278), "Annabel Lee," by Herbert Schmalz (287), may be noticed also. The fourth and fifth rooms are made up of sketches and studies of less mark as pictures, though, perhaps, more in accordance with the limitation which should be imposed on this medium. The works this time are chiefly the works of English artists who have learnt not to despise the medium of coloured chalk. It may be as well to draw, however, the line between sketches and studies and larger finished pictures in the more permanent vehicles. For the painter, as an expeditious mode of retaining transient effects of colour, sunlight, and shadow, the coloured crayon is invaluable; but we must not forget that it is also friable in its nature, and that the surface of the picture has to be carefully protected from injury by glass, and, therefore, for large and highly finished pictures, this medium is imperfect, and has its limitations.

ST. MARY'S CHURCH, CHESHAM, BUCKS.

By Frederick George Lee, D.D., F.S.A.

THIS church of Chesham*, dedicated to God in honour of the Blessed Virgin, though not to be reckoned of the first rank amongst the churches of Bucks, is a very good example of those of the second rank. Cruciform in shape, it consists of clerestoried nave, tower and spire, with north and south transepts, north and south aisles, a south porch, with parvise over it, approached by a circular staircase in a small turret. There is a large door at the west end of the nave of good design and effect.

The nave is of five bays, the pillars being octagonal with narrow capitals (now over-much restored). The north aisle, recently rebuilt and enlarged, has four Third Pointed windows of two lights each, cusped, and a closed-up north door. There is an Early English window at the west end of this aisle, filled with modern stained glass.

Like so many other of the more important churches of Buckinghamshire, the original building erected here was evidently Norman. Even prior to this, there may have been a Saxon church†, probably small and simple in its construction, of which scarcely any details or features now remain.

Of the Norman church there are several. Masonry, which is unmistakable, together with semicircular-arched windows (though imperfect), and a few very simple mouldings, were to be seen here and there prior to the period of the latest restoration, and some of the Norman windows still remain.

Externally, the present church, from east to west, is 132ft. 6in. in length. Its width across, between the outer faces of the walls of the transepts, is exactly 66ft.; its width internally is 51ft. 11in. The height of the tower is 64ft. 2in., and of the tower and spire 103ft. 9in. The tower area, measured within its pillars, is 16ft. by 12ft. 6in. The chancel proper, measured within, is 36ft. 6in. from east to west; the aisles are about 13ft. wide, that on the north side being at one end a few inches wider. The nave and aisles are about 64ft. 1in. in length. The transepts internally are 10ft. by 14ft. The nave, measured between the pillars, is 20ft. 8in. in breadth.

Of the character and architectural details of the church, the following facts may be put on record:—

The east window of the chancel is of three lights, and is a fair example of modern Decorated work—though from an old example—the upper tracery being effective, and the mouldings of the mullions bold and good. The stained glass—containing representations of Faith, Hope, and Charity personified—is not, however of a type to be recommended, the drawing being feeble, the colours too strong, and the absence throughout of light glass being a distinct loss.

On either side of the choir are two windows of the same architectural type, but having only two lights each. Below the westernmost window, on either side of the choir-stalls, is a low-side opening or leper's window, formerly closed by shutters and protected by stanchions, now glazed. The stained-glass window on the north side—to the memory of Thomas Nash and Mary his wife—is excellent, the design being creditable, and the colouring at once chaste and brilliant. A still better window—unusually good in design, and rich both in colour and tone, in memory of William Lowndes, of the adjacent mansion, called "The Bury"—is to be seen on the south side of the sanctuary. This is artistic and effective, and is one of the best modern pieces of glass to be found in that part of Buckinghamshire.

The north transept, measured within, is 10ft. by 14ft. Here on the west side is a plain Norman arch blocked up. The modern organ has been placed here, and a part of this transept is used as a vestry. An old altar-table, now put to a very common and unseemly use, has a domestic swing looking-glass upon it and a clothes-brush; a curious antique vestment-chest of oak, with iron bands and ancient locks, is possibly of 15th-century work—very simple, but very effective. Measured from the outside, not including the corner buttress, the depth of this transept is exactly 20ft. The east window is of two lights, and of Second Pointed work.

The lower and some other portions of the south transept are also undoubtedly Norman, though cased in parts with later stonework. The Norman doorway to the old rood-loft is still to be traced, upon which there are marks of old surface ornament now almost wholly obliterated. The south window is of three lights, and Early Perpendicular in style; while the east window of two lights, with a trefoil in the head, is of Second Pointed work. There are evident traces of two altars here. Two large Debased monuments block up the place (now set apart for school-children). These monuments are to the memory of Dame Mary Whichcote, who died in 1726, and to the Hon. John Cavendish, son of the first Earl of Devonshire, A.D. 1617. Several hatchments in good condition remain, interesting to the genealogist. I am informed that many Early English encaustic tiles, of marked simplicity of design, were found in this part during the last restoration. The south aisle is lighted by four Perpendicular windows of three lights, with a similar window at its west end. There is a Norman doorway at the east end, by which alone the south transept is now approached. Anciently there was a Second Pointed arch connecting this transept and the south aisle. But when the tower showed signs of weakness about two centuries ago, both the arch in question and the staircase to the rood-loft were blocked up with stone for safety's sake.

In the south central window of the clerestory there are several fragments of old stained glass, with here and there in other windows a perfect flowered quarry. The arms of Cheyne and of Francis Russell, Earl of Bedford, are likewise preserved.

The font—somewhat feeble in conception and finikin in detail—is modern, of an Early English design, the bowl being of Mansfield Woodhouse stone, and is placed at the centre of the west end of the nave. Originally, the old font, which was Norman in type and very plain*, stood just within the aisle, near the south porch, opposite the inner door to the parvise. It had a Second Pointed cover of oak, with ancient iron-work in scrolls. But both font and cover have been lost.

The oaken roof of the nave is of Late Perpendicular work, good in design, but not remarkable. The beams and plates, at the last restoration, were moulded and embattled, and the spaces over the beams, under the principal rafters, filled with tracery; traceried spandrels resting on the stone corbels also support the bearers. The south aisle and south transept roofs were carefully repaired, while a new roof was placed upon the chancel.

The last restoration was effected A.D. 1867—1869, under Mr. G. G. Scott, afterwards Sir Gilbert Scott, R.A.

The pulpit is modern, of oak, on a base of stone, placed to the north of the west arch of the tower. There is also a lectern of oak. The pews are of pitch-pine, panelled. Under the tower are new choir-stalls of oak; and there is yet another set of choir-stalls in the chancel proper. The Communion-rail is of oak; but the Communion-table and the east end generally are very ineffective and poor.

There is an ancient stone piscina in the south wall of the sanctuary, under a Second Pointed crocketed canopy, with a stone ledge above for the crewetts and altar-bread box, and a quatrefoiled bowl and drain below.

Some very interesting wall-paintings, discovered in 1868, went to prove that the whole of the walls of the interior had been originally covered with such and similar adornments. These were probably of 14th-century work, judging by some of the garments and head-dresses represented. In one case a bishop—possibly St. Birinus or St. Hugh of Lincoln—was drawn *in pontificalibus*, giving his benediction; in another St. Christopher was depicted bearing the Holy Child Jesus; in a third the Day of Judgement was represented, the Blessed Virgin Mary interceding on behalf of a soul being weighed in the balances of God's justice. This was rudely drawn, but told its story graphically, and with force. The splays of all the windows were likewise most efficiently adorned with floriated ornaments, conventionally drawn, and with fleurs-de-lys.

The east wall of the nave, consisting of a large space, is most feebly coloured, and is thoroughly ineffective—in truth a contemptible exhibition of modern polychrome. Everywhere unduly large and vulgar gas standards of brass and painted iron are placed about the church; and these in such unseemly and unfortunate positions that the smoke of the gas largely disfigures the church's roofs, and stone arches. These standards at once attract the eye.

On the east side of the south porch are the remains in stone of a holy-water stoup, once of considerable architectural interest. This is placed under a richly-floriated and decorated canopy, with pillars and pinnacles flanking it. The central crocketed portion of old terminated in a figure of Our Lord on the Cross—now much battered and almost destroyed. The stoup itself is gone.

In almost all the internal parts of the church various devices—masons' marks, personal monograms, merchants' signs, crosses of various kinds, and initials with dates (some of pre-Reformation times), are cut on the pillars and walls.† In

---

* "In ford, in ham, in ley, and ton,
The most of English surnames run."
—Old Rhyme.

"Chesham." — The standing-place, ham, home, or station, of Cessa or Chessa, or of the race of the Cessæ.—Mark Anthony Lower, of Lewes, F.S.A.

† An anonymous writer of the year 1772, who, previous to that time, had made "Notes" of several churches in the Chesham, Amersham, and Beaconsfield localities, believed that portions of the parish church of the first named were "Saxon"; but this term, as is now obvious, was at that period often applied to undoubted Norman work.—See Bucks MS. Collections, Bodleian Library, Vol. II. Folio 87A, in which some of these "Notes" are transcribed.

* This old font, now destroyed, was for some years used as a flower-vase in the rectory garden—the sacrament of Baptism having been administered by a small hand-basin.

† I have recently noticed similar marks on the walls of Godalming and Compton churches in Surrey. The practice of the British tourist thus cutting his name on public edifices is certainly one of some antiquity, and possibly of very general custom.



some cases these symbols and devices are of considerable antiquity. No traces, however, of any consecration-cross can now be found;* for in many places the walls and pillars have been all too efficiently scraped and mended.

The tower contains a peal of six bells, melodious and mellow. These were recast A.D. 1812, by Mears, of Whitechapel. The tenor bell weighs seventeen hundredweight. A smaller bell, hung in the year 1790, took the place of the old sanctus bell. The curfew bell is still rung during the six winter months—i.e., from September to March.

Externally the church is of very good and graceful proportions, evidencing both thought and artistic ability on the parts of those who have from time to time designed, repaired, or altered it. Originally it was Norman, and the lower part of its tower is, in substance, Norman still.† Now, however, every form of Pointed work is found somewhere or other embodied in the sacred edifice, which, notwithstanding this, retains its general architectural unity and artistic beauty. Its sky-outline from every point of view is exceedingly fine and picturesque.

On the clock in the tower stands the following inscription:—

THO. VERNON, FECIT
LONDINI, ANNO
DOMINI, 1728.

It has two dials; and some existing framework near, indicating that a machinery for chimes once existed.

Internally the general effect of the church is fair. But a transeptal arrangement with central tower is not at all adapted for the modern Church of England service; and to make the whole building into one auditorium is a mistake both architecturally and ecclesiastically.

In the chancel there is a curious memorial on the north side of the sanctuary to Richard Bowle, represented preaching, who died 18th December, 1626, aged 77. It has been recently repainted in strong and glaring colours.

* In the south aisle, until quite recently, one old consecration cross—a painted Maltese cross within a circle—remained; no doubt one of a perfect set.

† Several stone fragments of carving, full of interest, together with two broken cross-marked gravestones, respectively of the 12th and 13th centuries, are preserved in the parvise over the south porch, and are mainly of Norman work.

Anciently an old brass remained, now lost, with the following inscription:—

Of yor charite pray ffor the soules of
Will'm Eggerley, John Eggerley, Will'm Eggerley,
& Elizabeth Eggerley, ye children of Robt.
Eggerley and Kateryn his Wyfe.

There are several other monuments of interest, in memory of members of certain old, noble, and respectable families. For example:—

1. Mary Lady Whichcote, wife of Sir Francis Whichcote, of Aswarby, Lincolnshire, daughter of Joseph Bankes, of Revesby, in the same county, Esquire, already referred to. This is in the south transept.

2. Rev. Richard Woodcock, S.T.B., who "placidè obdormivit in Domino, Oct. XX., A.D. 1623, ætatis suae, LXVIII."

3. Elizabeth, wife of Nathaniel Bogle French, Esq., and daughter of Anne and Augustine Skottowe, Esq., of Great Ayton, Yorkshire.

4. Several to the memories of other members of the Skottowe race, e.g., Nicholas, and Grace his wife; of John Skottowe, Governor of St. Helena; of Thomas Skottowe, of North Carolina; also of Coulson Skottowe and Anne his wife."

5. And others to the ancient Cornish race of Arundell; some of whom lived at Towersey, Bucks, A.D. 1500.

'Here lyeth Joyce, the Wife of Edward Arundell, of Cornwall, Gent, and Neice unto Sir Thomas Arundell, of Chesham. She dyed in London ye last of May, 1702, and desired to be Buried here amongst her Relations. *Requiescant in pace.*"

"Here lyeth Edward Arundell, late of Cornwall, Gent, who died May the 13th, 17— aged —, who desired to be buried near his wife. *Requiescant in pace.*"

THE LONDON SCHOOL BOARD CONTRACTS.

AN adjourned meeting of London builders was held at Anderton's Hotel, Fleet-street, on Tuesday night, to protest against the proposed new regulations of the London School Board with reference to building and repairing contracts, by which it is intended to select some special firms of builders to contract for the painting and repair of old schools and the building of new ones. Mr. L. Stevens, L.C.C., presided. Mr. Geo. Barker, hon. secretary, read a report embodying the chief grievances of the builders in this matter. Mr. Urquhart described the proposed change as a most iniquitous proceeding. The proper course, he said, was to act in accordance with the Act of Parliament, and offer for public competition all work exceeding £100 in value. The work for the School Board had hitherto been done in London by some 150 builders, and if it had not been done satisfactorily in any particular instance the fault must rest solely on those who occupied the high position of surveyors to the School Board for London. He considered that the Board of Works never did anything so iniquitous as that now proposed by the School Board. Mr. White said that the Board were proposing to revert to a system which had already been proved to be dis advantageous both to the Board and the rate payers. Many of the smaller contractors, he believed, could do the work quite as well as the larger ones, and at a price 25 per cent. lower Mr. Roston Bourke, a member of the Schoo Board, said that what the builders were advocating coincided exactly with his principles. He contended that every ratepayer should have the chance of competing when there was work to be done. Mr. H. Lynn, another member of the Board, said that he would do all he could to decentralise the work, and give it to some of the local contractors. As far as the voters for West Lambeth were concerned, he knew that they were in favour of the open contract system. If the assertion was true that they could not possibly get enough men to do their painting and repairing in August, he should like to ask how it was possible for them to get seven firms only to do the whole of it in the same time. He knew that a large number of the members of the Board were determined to have a public fight on this question. Mr. Cooke, another member, also spoke.

The proposal to construct a new street from Holborn to the Strand was discussed at great length by the London County Council on Tuesday. On the motion of Lord Compton, it was resolved to postpone the consideration of the question until all insanitary areas had been dealt with, and a scheme presented for the rehousing of the working classes who would be displaced.

Mr. James C. Stevenson, M.P. for South Shields, and chairman of the River Tyne Commissioners, has been presented with a portrait of himself by Mr. W. Q. Orchardson, R.A., for the Board-room of the Commission.

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ILLUSTRATIONS.

KEBLE COLLEGE CHAPEL, OXON. DUTCH AND BELGIAN RENAISSANCE WORK.—PROPOSED COTTAGE AT WROXHAM.—NEW CONSERVATIVE CLUB, ACCRINGTON.—PIERREPOINT, SURREY.—HOUSES AT BELLAGGIO AND NORTHWOOD.—PAIR OF COTTAGES.

OUR LITHOGRAPHIC ILLUSTRATIONS.

KEBLE COLLEGE CHAPEL, OXFORD.

Dedicated on St. Mark's Day, 25th April, 1876, Keble Chapel will ever remain a superb and most characteristic example of the genius of Mr. Butterfield, from whose designs it was built, at the generous cost of the late Mr. W. Gibbs. The treatment throughout of the fabric is essentially "modern" in spirit, and the result is wholly successful. Its interior, of lofty and fine proportions, is specially interesting for its splendid decorative scheme, of which the principal components are mosaic, marble, and red and yellow brick, most judiciously juxtaposed. These chromatic elements, together with a wealth of sculptured detail, help to make up what may perhaps be considered the most strikingly beautiful *tout ensemble* in Oxford.—Cecil Bradshaw Roper.

DUTCH AND BELGIAN RENAISSANCE.

This sheet of drawings, by Messrs. Henri Leeuw and Emil Mouris, is reproduced, by permission, from the plates of the volume just published by Mr. E. A. Seemann, of Leipzig, entitled "Die Renaissance in Belgien und Holland," by Professor Franz Ewerbeck, and for which Mr. Batsford is the London agent. Our choice of the subjects represented herewith has been made not only with a view of showing how comprehensive the work before us actually is, but because the objects illustrated are in themselves specially interesting, and clearly typify the particular style of detail so characteristic of the Renaissance of the Low Countries now so much in favour with English architects. The Porch at Zutphen is from the Weinhaus—a striking building situated in the market-place of that town. Its lofty tower, surmounted by two octagonal stages in red brick and stone, is crowned by a wooden belfry of picturesque outline. An open staircase of two flights rising right and left from the street towards this central tower communicates with the large hall on the first floor. The lower story is approached from the market-place by a large doorway under the porch already mentioned. The first few steps of the left-hand staircase, looked at from the return front, are seen in the sketch which we give illustrating the side entrance, with the balcony over it. The design is so clearly delineated that little description of it is necessary. The balustrade capping is returned in itself, and stands free of the columns at the angles. The pediment contains a cartouche, with heraldic enrichments, and supported by two boldly-carved lions. The shafts are monoliths, and the cushioned frieze is shown without jointings along the lintel. The walls are built of small, narrow bricks in what is called English bond in headers and stretchers, which seems curious for Dutch work. To the rear of the building the walls have piers supported on corbels, with intermediate ones taking the skew-backs between the arches above. These latter are enriched with figure carvings and heads, two of which we show by Figs. D and E. A and B are two of the first-named series, with grotesque masks upon them. The bedstead from Ghent is a particularly good example of Flemish furniture, having a very rich front and elaborated ends. It is dated 1605, and is said to have been made by Vredemann de Vriese, and belonged to the collection of Minard of Ghent, but the piece is now at St. Petersburg. The book opens with a series of highly interesting drawings and plans of the Chateau d'Odyonck at Ghent, the ancient castle of Herr von Nevele, to which we drew attention when noticing the earlier parts of Professor Ewerbeck's work last year.* Furnes furnishes a considerable series of plates with fireplaces, settles, stalls, and screens, besides examples of street architecture, and from Nivelle we have some first-rate Italian-like Belgian woodwork. The Zeeland town of Veere, near Middlebourg, the capital, stands on a great canal, and has some quaint waterside houses with unambitious fronts and simple gables. A shop here, drawn by Professor Ewerbeck, is a typical specimen; and the next plate shows the lofty tower of the singular town hall at Veere, which is entirely Dutch in character. A large silver-gilt cup in this building, with the inscription, "XV. Septemb. MDXL. v. I. Maximilian, comes a Buren invitis hostib. trajecto Rheno Caesaris castris suas commingit copias," is only one of many other specimens of metal-work illustrated in this collection, among them being several lock-plates, escutcheons, and hinges from Domestic and Church furniture. From Zwolle in Overyssel, is represented a handsome wooden screen across the choir of St. Michael's Church, with very large crowning cartouche ornaments, rising like gables along the cornice. It is dated 1597. The following plates are well occupied with enlarged details of its parts. The double staircase attached to a Gothic-built weigh-house at Deventer, on the Yssel, is a singularly quaint example, having a balcony or terrace overlooking the street, resting on an arcade elaborated in detail with sunk panels and lozenges, the spandrels being filled with flatly-carved cherubs. Some capital gable fronts are shown from Zutphen and Middlebourg, very suggestive for street architecture. The chained book-stalls in the library of the Walpurgiskirche at Zutphen are particularly good in their shape and carvings, and deserve the good drawing by which they are shown. Ghent and Bruges supply some more familiar samples of work, though in cities like these, which are such storehouses, as it were, of old structures, it is not surprising that many fresh things are here represented, as, for instance, the loggia and staircase from the courtyard of the Halles, at Bruges. The great chimneypiece in the hall of the Palais de Justice at Bruges is illustrated by a photograph printed in ink, as well as some first-rate details drawn in chalk lithography to a good large scale. The conical-roofed belfry of the church at Knocke, near Heyst, might well serve as the model for a like new building, and the town hall at Bolswaert, in Friesland, has much to recommend it for modern civic architecture, with its square-headed windows and ample high roofs, at once convenient, picturesque, and effective. The examples of sky-lines from Halle, Buren, Hoorn, on the Zuyder Zee, and Zwolle, are less to be commended by reason of their extravagance. The Tower Gate, of 15th-century date, at Dordrecht, is much more simple and satisfactory. The Towers from Alkmaar and Nymwegen are equally good in their way, and eminently typical of the Netherlands. Several pages of examples of woodwork from Brussels and Antwerp conclude the volume, and help to make its contents useful and suggestive to all engaged in decorative design. The folio is well printed, and Mr. Seemann is to be congratulated on his latest architectural book of the Renaissance.

COTTAGE AT WROXHAM, NORFOLK.

This cottage was originally designed for a site at Wroxham, Norfolk, but is now about to be erected in Kent. The bricks are to be of an orange-red colour, and the tile hanging to be in bands of fishtail and plain tiles alternately, the roofs being covered with Broseley tiles. The interiors of the dining room and hall are to be fitted with oak panelling throughout, the staircase also being in oak. The dining room has a serving hatch to kitchen, the ingle being lined throughout with small brown-glazed bricks. There are three bedrooms and one servant's room on first floor, also bath, w.c., &c.; the windows generally to be in deal, painted white, with plain lead lights and iron casements. The cost is estimated at £1,200, the architect being Mr. Laurence Youngs, A.R.I.B.A., 99, Ladbroke-road, W.

* Building News, Nov. 2, 1888, Two Dutch Chimney-pieces.

NEW CONSERVATIVE CLUB, ACCRINGTON.

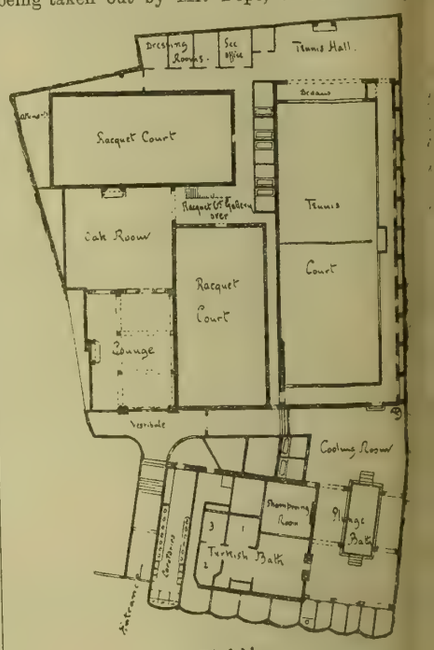
The competition for this building was reported upon a few weeks since in our paper, and a general description given. The design is by Messrs. Morley and Woodhouse, of Bradford and Bolton. The building is intended for the central club of the district, and contains billiard-rooms, smoke-rooms, secretary's rooms, and committee rooms, also rooms for registration of votes, and a large assembly hall to be used for public meetings, balls, receptions, &c. The building will be faced outside with Yorkshire stone; the plans given will sufficiently explain themselves.

PIERREPOINT, FARNHAM, SURREY.

The extensive additions which our illustration represents comprise new loose-boxes, coach-house, mess-room, dormitories, entrance gateway with rooms over, water and clock tower, gardener's, carpenter's, and painter's sheds, dog kennels, stores, &c. A new servants' hall, bakehouse, and larders have also been recently added. The whole of these works have been carried out by Messrs. Tompsett and Kingham, builders, Farnham, under the superintendence of Mr. H. T. Keates, architect, Petersfield.

PRINCE'S RACQUET AND TENNIS CLUB.

We append a plan of this building, which we illustrated last week, and with which it should have appeared. The club has been built by Messrs. Peto Bros., from the designs of the architect, Mr. E. H. Bourchier, A.R.I.B.A., of 32, Great George-street, S.W., the quantities being taken out by Mr. Pope, of John-street,



PLAN.

Adelphi; and the decorations and furnishing have been directed personally by a member of the club, Mr. George Donaldson, who also designed the oak room ceiling. The electric-lighting is by the United Electric Engineering Company, under the supervision of Major-General Webber, C.B. The floors of the racquet courts were laid most successfully by Claridge's Asphalte Company. We are also asked by Messrs. Campbell, Smith and Co. to say that they decorated the cooling-room and plunge-bath. The whole of the work was last week ascribed to Sg. Marolde and assistants, whereas Messrs. Campbell, Smith and Co. say he only did the shampooing department.

WAYSIDE NOTES.

ALL good architects and true have the interests of the artisan and labourer at heart. It is only the small minority of the bullying class that regard the workman as a mere machine, undeserving, and not requiring any consideration. Sympathy with those whose hands actually produce the structure that the architect designs, besides being evidence of the gentleman, is in every way conducive to the progress of architecture and the prosperity of its handmaidens. Of the many trades engaged in the building industry, not the least deserving of a helping hand are the masons and stonecutters. Indeed, if we remember in days past the master-mason was as often as not, to all practical intents and purposes, the architect, it is this very trade that should especially demand our fostering care. I would, therefore, draw the attention of such of your readers as may have overlooked the communication, to the letter you published last week, from certain foremen masons and others, in reference to the masonry classes to be held at South Kensington under the direction of Mr. Lawrence Harvey. I doubt not but that very many will sympathise with their efforts in endeavouring to reduce the amount of the fees to be paid in connection with this series of lectures and studies. A sum of two-and-a-half guineas is certainly such as would prevent many desirous of improving themselves, from joining the classes, and it is sincerely to be hoped that the committee will meet with the support it undoubtedly deserves from members of our profession.

Appeals of this nature should also find hearty response from master builders and contractors, such persons benefitting, in a direct manner, from the possession of more than ordinary intelligent artisans. To possess a body of specially trained and able workmen is no small advantage; for, happily, even in these days of rush and scramble and undercutting in tendering, there is yet, and will ever be, scope for the builder and contractor to create sound and lucrative business by the mere force of integrity and unvarying excellence in building. To do this, however, necessitates the possession of an exceptionally efficient staff, composed of men who have striven to improve themselves in their craft. For this reason, I say that contractors should assist appeals like the one noticed, and also do all they can to promote and develop schemes of technical education. It is, we all know, difficult enough at times to get artisans to bestir themselves at all in the matter of self-improvement, so that when signs of a desire to rise make themselves evident, they should be studiously encouraged by all interested in the welfare of the British workman.

I read your report of Mr. W. D. Dunn's lecture on "Architects as Scientists," delivered at Newcastle before the Northern Architectural Association, with much interest; but, in connection with a view therein expressed, would point out that there is a marked difference between knowing *how to do* a thing and being able *to do* it. Theoretically, we should be able, as Mr. Dunn said, to take the tool from the workman and show him how to use it; but, practically, all that is required is to be able to tell exactly when work is done and being done as it should be. There is all the difference in the world in this. Nevertheless, I have long thought that the regeneration of the architect's calling is to be looked for in the direction of so educating those embracing it, that they should actually be able thus to wield tools in every trade. Reasoning from what we see accomplished in other walks in life, it would seem desirable that the architect should, in his young days, have passed a year or two in workshops and on works as a student of building construction. In the engineering profession we know how much benefit accrues from passing through "the shops." I often feel that similar benefit would attend any such system in the training of architectural students. That a vast improvement would then be visible in construction there can be no doubt, and if nothing else were gained, architects would be rid of the charge of being mere theorists and the "practical man," snare and delusion as he is, would not be so often cast in our teeth—could *never* be held up to our supposed homage.

At present we know that the architect acquires his practical knowledge in a happy-go-lucky sort of manner. Many never get practical at all, and their errors and mistakes inflict no little damage upon the interests of the profession. In the majority of cases the young architect acquires little sound practical knowledge as a pupil or assistant. When he has to stand on his own legs he is constantly in fear and trembling, lest, by some indiscretion, he may make himself look foolish in the eyes of his client or builder, or lest by want of experience he may make some constructional blunder that will ruin his prospects for life. Some do pick up a smattering of knowledge during their pupilage, and add to it during their assistantship. By much anxious care they acquire sufficient knowledge of practical construction to allow them to practise with some confidence and peace of mind. Those whom their employers are kind enough to place as "clerks of the works" (save the mark!) may consider themselves born under a lucky star, and may well put up with any snubs from contractor or men that their greenness may call forth. They gain valuable experience. "Go and stake the ground out yourself," said a worthy gentleman of my acquaintance to men on a job he had been placed upon as "clerk of the works," "and don't bother me now, or you will get the 'sack'; I will check the work after you." And while the men worked my good friend looked out of the corner of his office window, and, observing their method of procedure, was subsequently able to manage the "checking." What do *you* think?

Now it has long appeared to me a grievous thing that in place of all this chance acquirement of practical knowledge by architects in their young days, there should not be some scientific system arranged whereby there should be no doubt but that everyone, in due course, who passes the portals of the architectural profession, has acquired the sound, practical, workaday knowledge that *must* be an attribute of the true architect. And it appears to me, as I have worded it above, that the regeneration of the architectural profession is to be found only in remedying this grievous shortcoming. The embryo architect must pass through the shops, or live on works—whether before or after pupilage is a matter for much consideration. There are many objections that might be urged and combatted perhaps. Of one that will be hastily put forward I will dispose of at once; it relates to the bad effects of those black sheep the student might be brought into contact with. This is a spurious objection; for though if the youth be ignoble he will surely be dragged down, yet, if he be of sterling worth, the effect would only be that of a refining fire.

So the members of the town council of Longton were much exercised in their minds as to whether they should reserve the competition for their park pavilion for the benefit of local architects, or throw it *open to the world!* It is to be hoped that the members did not worry themselves over-much, although, doubtless, a park pavilion is an important undertaking in its way, and deserves the attention of all the architects of the world. I suppose when the designs for the great edifice come in, there will be more lengthy discussion by the Town Council as to who is to have the chance of the job of erecting the structure, and more exercising of minds will take place as to whether local talent should be employed or 'xtra T, attracted by inviting tenders from the contractors of the world. It is soothing to read that the Mayor of Longton had the good taste and sense to restrict the competition for the park pavilion. His action, however, in that it has for ever lost us the chance of getting the great job may, perhaps, have caused the body architectural some pangs; but time may heal the wounds.

The County Council, I see, have deferred, for further consideration, the scheme for constructing a new street from Holborn to the Strand, and for effecting certain other improvements in the neighbourhood. A considerable amount of opposition was raised to the proposal to clear away so many dwellings of the poor without providing more adequate accommodation. The opposition, however, cannot be seriously prolonged. When it is shown that every care has been taken to provide dwellings for the poor, consistent with making improvements in the neighbourhood, the scheme must go forward modified, or as projected at the outset. It is not as if the undertaking were one that had been hastily arranged; for the late Board of Works had the question of the removal of the Holywell-street block before them for a couple of years, and the proposed new thoroughfare between Southampton-row and Catherine-street is likewise the outcome of much deliberation in the past. The necessity for some sort of communication between the eastern portion of the Strand and the north of London has been long felt, and must have often come forcibly home to those who have had occasion to get to any of the great termini, and, having somewhat delayed the cab-hiring, find a hopeless "block" in one of the narrow thoroughfares through which Jehu essays to pass.

GOTH.

HOUSE AT BELLAGGIO.

THIS house has been built at Bellaggio, on a site having a very magnificent view. The walls on the ground floor are of red local bricks, and those on the first floor are of stud-work, cemented and "dashed." The roofs are tiled. The architect is Mr. R. A. Briggs, A.R.I.B.A., of 2, Devonshire-square, E.C.

HOUSE AT NORTHWOOD.

THIS house is now being built on the Northwood Estate, near Pinner, for Dr. Dove. The walls are of red local bricks, and the roofs are tiled. The architect is Mr. R. A. Briggs, A.R.I.B.A., of 2, Devonshire-square, E.C., and the builder Mr. S. Barnett, of High-road, Kilburn.

PAIR OF COTTAGES.

THESE cottages, designed for the Upminster Hall Estate, near Romford, are a good example of effective and inexpensive building. The fireplaces are centralised as much as possible, and admit of the flues being carried up together—forming a central feature. This arrangement, besides, in a measure, averting smoky chimneys, adds greatly to the warmth of the apartments, and is, of course, cheaper in construction. The ground floor contains two good-sized rooms, with scullery, pantry, store, and coal-place, with an outside earth-closet, and there are three bedrooms on the first floor. They are designed to be built in red brick, with tiled roof and half-timber work in the gable. The architect is Mr. Fred. Chancellor, of London and Chelmsford.

CHIPS.

Memorial stones in a new Sunday school, to be built at the rear of Southgate Congregational Church, Gloucester, were laid on Friday. The buildings were designed by Mr. J. Fletcher Trew, and the builders are Messrs. D. C. Jones and Co., of Gloucester; the total cost, with furnishing and heating, will be about £1,800.

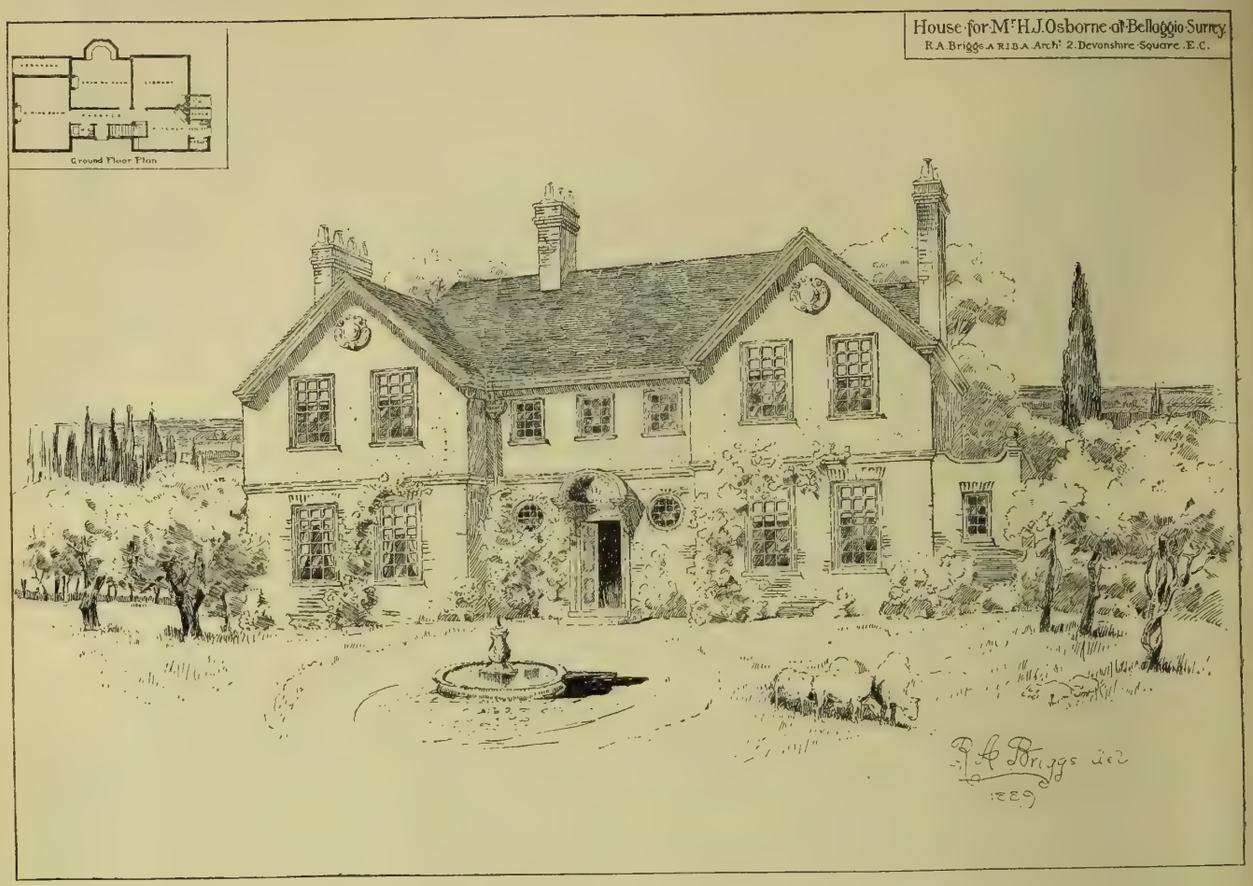
New schools in connection with the parish church of Ipplepen were opened last week. They have been built from plans by Mr. Tollitt, of Totnes, from whose designs a vicarage has just been completed.

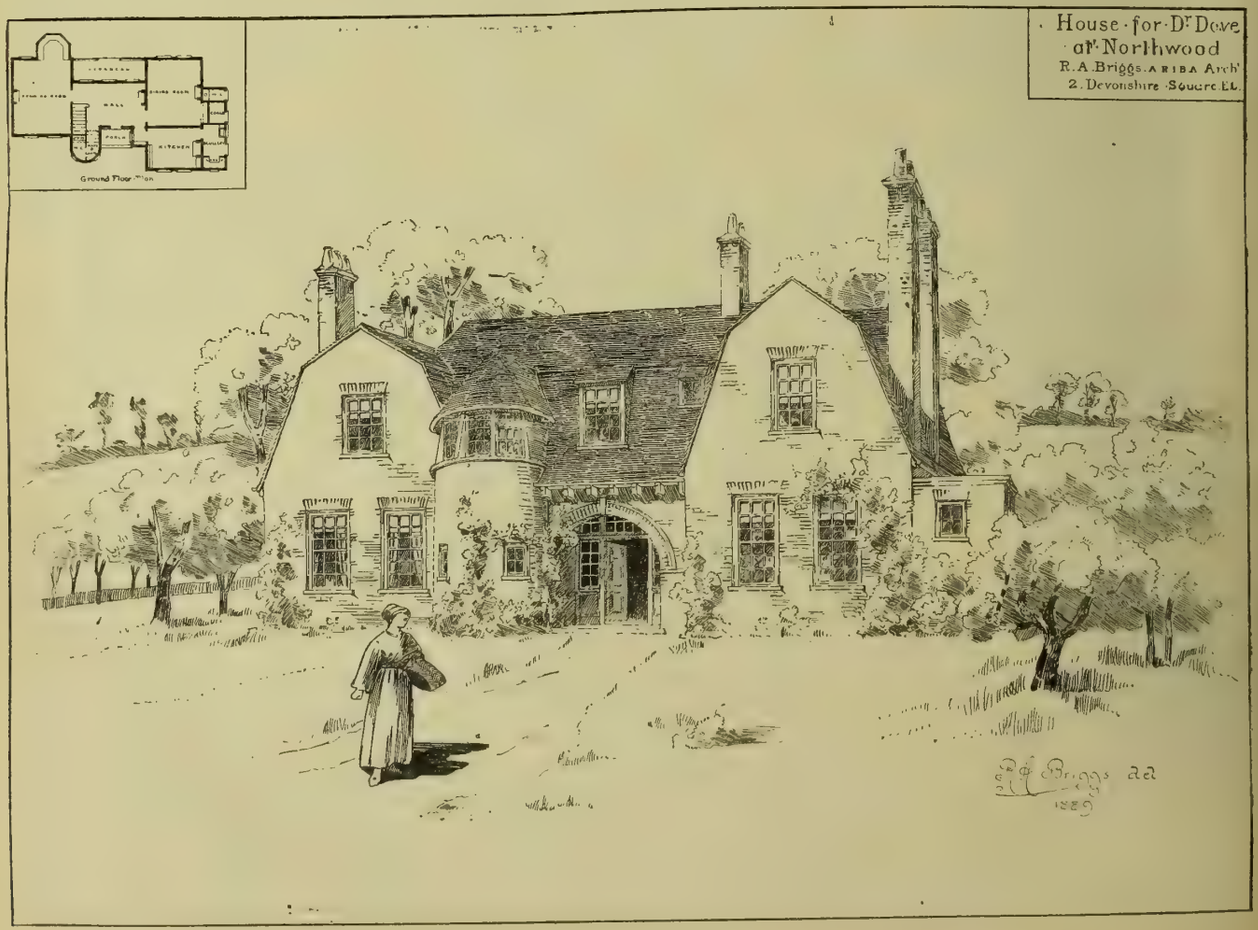
A tower and spire, built of local stone, are being added to Edale Church, Derbyshire, from the designs of the architect of the entire edifice, Mr. William Dawes, of London and Manchester.

The memorial stone of a new church at Craiglockhart was laid on Monday by Lord Balfour of Burleigh. The church is being built from plans by Messrs. Hay and Anderson, of Edinburgh; Mr. Robert Brownlee, of Colinton, is the contractor. The church—the style of which is 15th-century Gothic with Scottish characteristics—will be seated for 400 persons. It will consist of a nave 70ft. 6in. by 28ft. 6in., with a vestry and heating-chamber at the east end, and a porch forming the lower portion of a tower at the south-west corner.

The local board of Camborne having applied for leave to borrow £1,540 for works of sewerage at Tuckingmill, Troon, and Barripper, Mr. S. J. Smith, C.E., Local Government Board Inspector, held an inquiry on Tuesday week. Sanction will probably be granted.

The laying of the foundation stones of Weston-super-Mare new Bible Christian Chapel, in Locking-road, took place on Friday. The contract for building has been taken by Mr. T. Allen, the estimated cost being £1,300. The architects are Messrs. Hans-Price and Wooler. The chapel will be 48ft. by 38ft., and the schoolroom and vestry 50ft. by 16ft. 6in. The chapel will provide accommodation for 400 persons, and the schoolroom for 200 children. The building will be of native stone with freestone dressings.

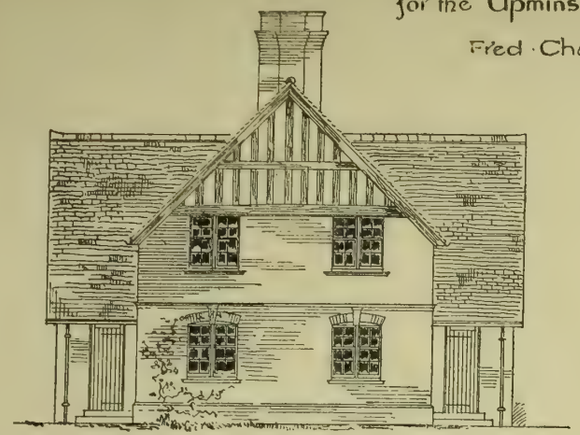

House for Mr H.J. Osborne at Bellagio Surrey
R.A. Briggs A.R.I.B.A. Arch.t 2. Devonshire Square. E.C.
Ground Floor Plan
R A Briggs del
1889


House for Dr Dove at Northwood
R.A. Briggs A.R.I.B.A. Arch.t
2. Devonshire Square E.C.
Ground Floor Plan
R A Briggs del
1889

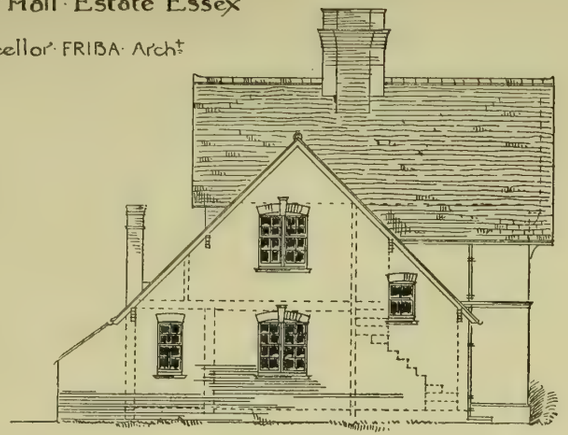
Semi-detached Cottages

for the Upminster Hall Estate Essex

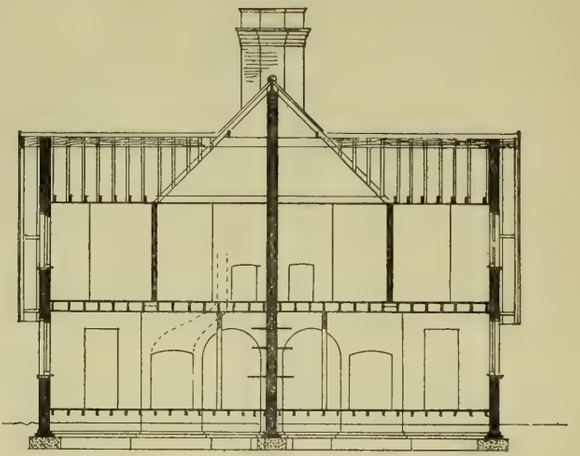
Fred Chancellor FRIBA Archt



Front Elevation

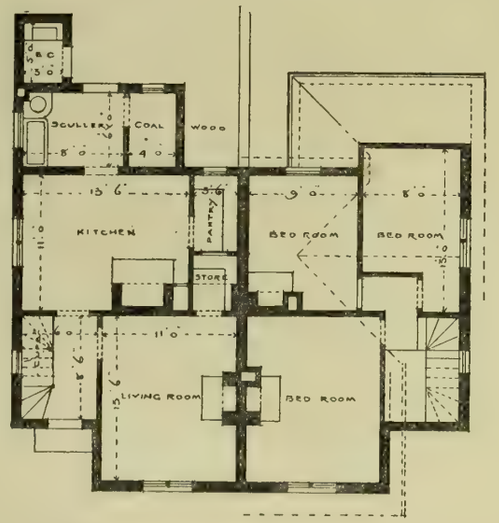


Side Elevation



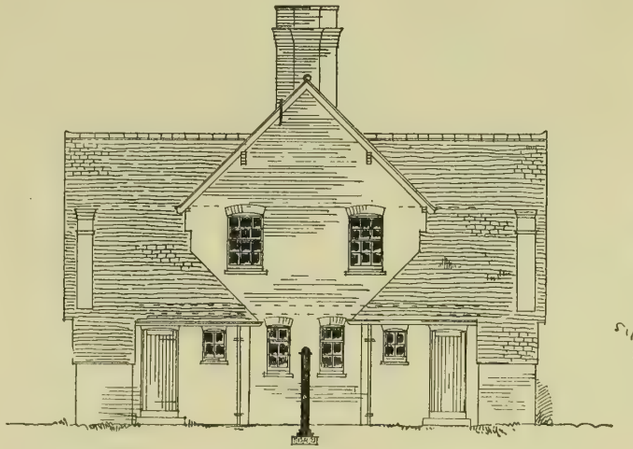
Section

Scale 10 5 0 10 20 30 40 feet

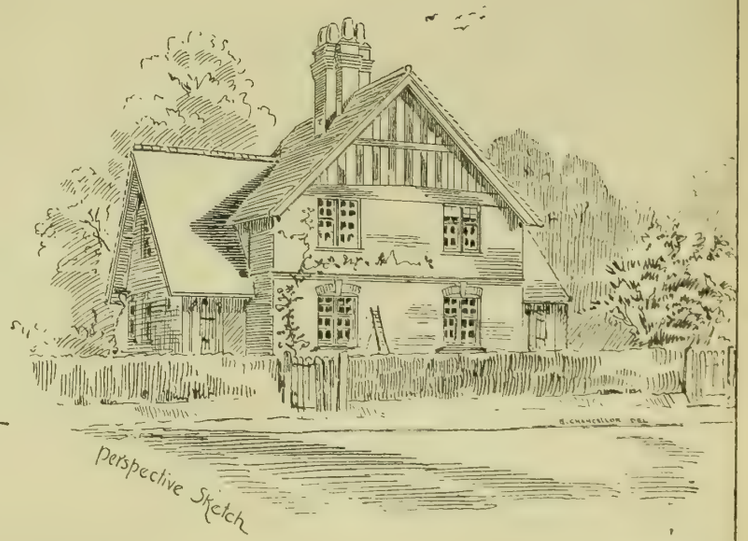


Ground Plan

First Floor Plan



Back Elevation



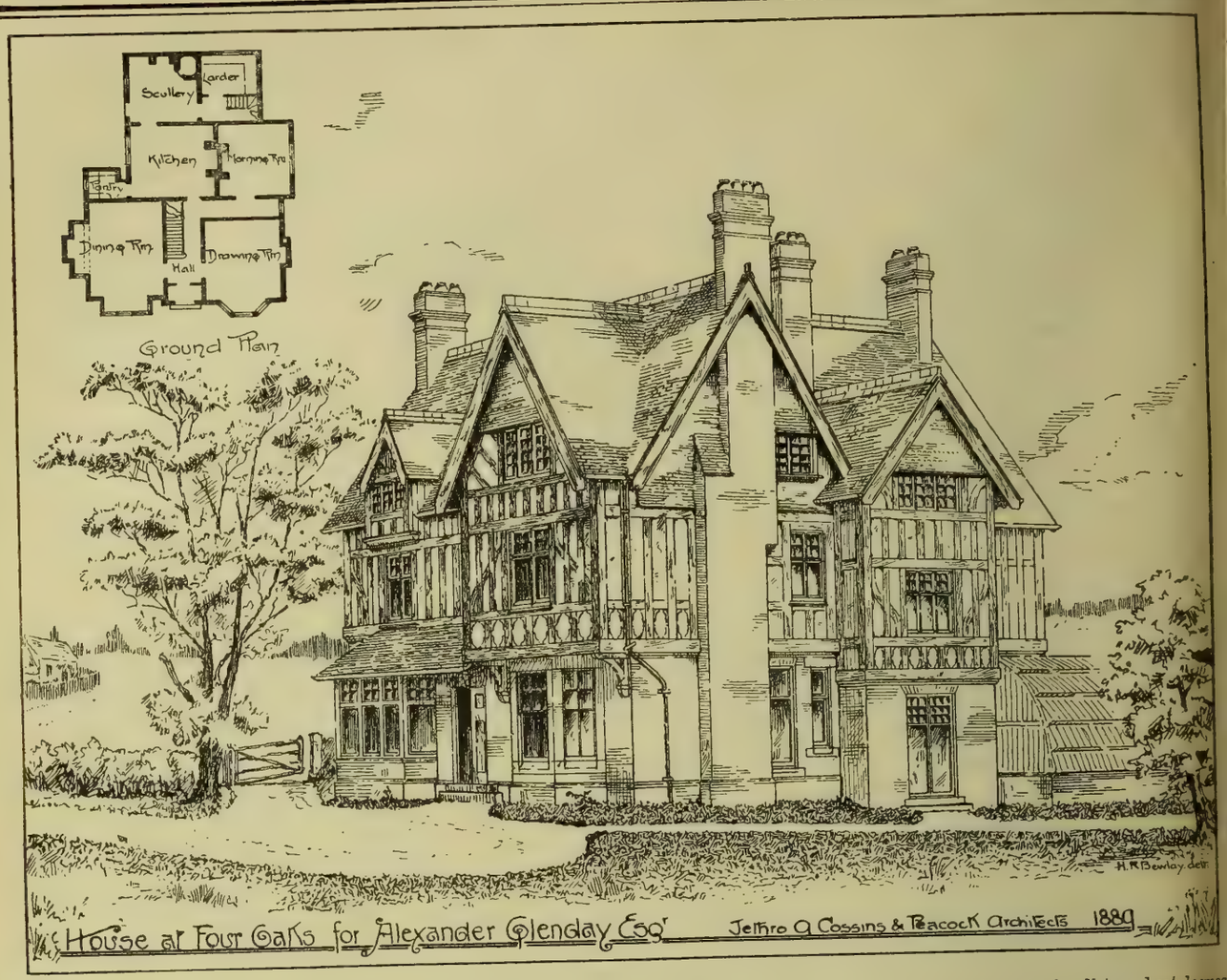
Perspective Sketch

APPLIED ART.

THE first of a course of six free lectures on "The Distribution and Application of Ornament, with reference to Surface, Material, Construction, and Purpose," was delivered by Mr. Hugh Stannus, F.R.I.B.A., at the Slade Library, University College, Gower-street, on Tuesday evening. The address was illustrated by a large number of coloured diagrams and examples. The lecturer explained that he proposed to treat the subject, a novel one in the college, in a comparatively elementary manner, so that all present might feel that they could understand and follow his points. Applied art had points of contact with many of the courses of lectures delivered in the college; in regard to architecture, the applied arts had an important, though very subordinate, part to play; they had some influence as the accessories of painting and sculpture; while in regard to the science of archæology their study furnished the requisite knowledge which had led to such splendid guesses at the genesis and history of early civilisation by demonstrating the progress of the arts. An unfair comparison was often made between the progress of art and of science. It was true that the advance of science was that of an ever-deepening and broadening river, whereas that of art, in its fluctuations, resembled rather the course of an intermittent spring, which at times disappeared from sight. But the difference between art and science was this, that whereas the latter added every fact wrested from nature to the accumulated heap of knowledge, so that each generation inherited the stores gathered by all previous ones, art had to be acquired afresh by each individual worker, who must start *de novo* to gain the needed knowledge and experience. Science was a hardy shrub, ever growing and expanding; art an annual which died down to the roots each year. The distinction between fine art and applied art was that the former occupied itself with the representation of the noblest objects for the noblest purposes, telling a definite story in the best language at its command, while applied art confined itself to a lower range of subjects, geometrical figures, plants, animals, and the human figure; it did not attempt to tell a story, but only suggested a meaning. The aim and province of applied art was to rest and soothe the mind, and to represent objects which demanded from the spectator no severe mental effort. He proposed in that lecture to deal with the elements of decoration. Everything that added to the interest of an object might be termed decorative. Decoration might be classified in grades according to the motive of general treatment in a gradually ascending scale from mere mathematical figures to the representation of the human form. In this manner it would be divided into some ten classes in a steady crescendo passage from the lower to the higher. The first was the geometrical or mathematical type of forms. This was largely used by the Moors, and, while very effective, was not of a kind that the mind could dwell upon with interest. The second class consisted of the strap and framework forms, and was much employed in the Elizabethan period. Its ingenious systems of interlacings were derived from two widely separated sources—partly from the East through the Crusaders and Italian traders, and partly from Scandinavia, whence it reached England by way of Ireland and the west coast of Scotland. The third class comprised decoration directly copied from natural foliage; examples of the wall-papers and stained-glass cartoons of a generation since, when it was the fashion to strive to imitate plants and blossoms without selection or modification, were exhibited. A fourth class of decoration was based on what might be termed the "artificial" foliage, being derived from the so-called Acanthus leaf. The influence of this type was seen not only in Greek and Roman ornament, but also in Renaissance work. Many examples were shown of Classic and 16th-century Italian modifications of this form of ornamentation, the lecturer remarking, *en passant*, that it was a mistake to term this "conventional" decoration. Artificial objects—i.e., trophies or emblems, or, as they were often termed by artists, "properties"—formed the fifth and a very large class. Such objects as the cross, the crescent, sacrificial wreaths, skulls, and pateræ were first used as religious or mythological emblems, and gradually became, by frequent use, mere symbols, and it was interesting to trace the mode in which this constant degradation progressed. As soon as objects or symbols of worship were recognised as beautiful in themselves they were introduced into ornamentation for æsthetic reasons—i.e., because they gave pleasure to the mind. This could be traced all through the ages; the emblems of one race became the mere ornament of the next. The decorator ought to observe great caution in the selection of these ornaments, so as not to offend the susceptibilities of others, and should not use a language which was not easily understood. In like manner, trophies of arms and heraldry furnished other types of this class, which lent themselves effectively to decorative purposes. A sixth class was drawn from natural phenomena, a seventh from portions of animal and human figures, such as heads, masks and skulls, paws and wings. In the use of skulls as decoration, he considered those of oxen or sheep could be introduced without offence, whereas the use of human skulls was hardly permissible to the decorator. An eighth class was that of the grotesque, or, as we should spell and pronounce the word, *grottesque*, for the term was derived from the figures found when digging in Rome into the vaulted Baths of Titus, which were at first supposed to be grottoes. A ninth class consisted in portions of the human figure or of animals ending in flowing scrolls and other ornament, a treatment very usual in the Renaissance. It should only be adopted in very florid decoration, and then but sparingly. A well-known example was to be seen on the famous pulpit at the Duomo of Siena. The tenth and highest class was that in which the human figure, the noblest form that could be so employed, was used in decoration, and the finest example of this mode of treatment was Michael Angelo's work in the Sistine Chapel. Some one or more of the ten classes of decoration entered into every work of applied art. In decoration we had to use these elements, subject to certain rules and principles. The whole of these had probably never been employed by any one people at any one time. Some elements, such as the human figure, should only be introduced into important works, the lower ones could be employed anywhere. The lowest could be repeated, and in patterns; but they should be used more sparingly as we advanced in the scale, and the highest class could only be introduced unically. In conclusion, Mr. Stannus showed that there were three methods of treatment for applied art: the didactic, where facts were illustrated without much selection or attention to surroundings; secondly, the æsthetic, wherein eclecticism was shown, and also modification, or idealism to suit the requirements and environments; and thirdly, the technic, in which the artist took into consideration the tools he worked with, and the materials employed, and this was what was correctly termed "conventionalism." The technic conventionalism was illustrated in the manner in which the iris of the eye and the junction of the mucous membrane and general integument in the lips were so indicated in a sculptured bust as to be pictorially correct, although not following the outline obtained in a cast. In his next two lectures Mr. Stannus will treat on the theory of the distribution of decoration, and in the closing three lectures on its application.

PLUMBERS' WORK IN FRANCE.

MR. R. J. LYNE, R.P.C., an operative plumber, the delegate appointed by the Lord Mayor's Committee to inspect the exhibits at the Paris Exhibition, has just written a practical and interesting report on what he noticed when abroad. Plumbing in Paris seems, he says, to be undergoing a complete change, the English system having been introduced by a M. Poupard, formerly employed by one of our large firms. The English system of sanitary plumbing is making progress. Hitherto, neither doctors, architects, engineers, nor plumbers have paid much attention to the effect of bad plumbing on the public health. Our French friends are doing their utmost to learn sanitary plumbing as carried out in England; also to bring the quality of their workmanship up to the English standard. But, although they are very persevering in that direction, they have yet a deal to learn. The master plumbers of Paris have formed a practical and technical class, under the special direction of M. Poupard. The technical instruction is given by the masters, while the practical instruction has been given, until lately, by an Englishman. The English system is being taught by the masters. The journeymen are also moving in the same direction. They have practical and technical instruction given by French teachers paid by the Municipal Council. As regards the quality of work in plumbing, the French recognise that they are behind us, as both masters and journeymen are pushing forward to the English style. In the Exhibition are shown specimens of work done by the students of these classes. In the exhibit under the direction of M. Poupard are shown, as specimens of the students' work, joints of different sizes, bends of different-sized pipes, lead-bossing in breaks and corners—one piece of lead with four breaks and eight corners, in the shape of a cross, the breaks being bossed up 6in. high, with very regular thickness—and other pieces of bossing which prove that the students are making good progress under English instruction. There is also shown a complete kit of English plumbers' tools. The French kit of tools has among them a pair of bellows for the purpose of blowing up a charcoal fire. They have no round mallet, such as we use for lead-laying; theirs is like a croquet mallet. Their shave-hook is made out of a piece of steel, with the blade hammered out of same. Mr. Lyne cannot see any advantage in this. Their hammer is square-headed, with the same shape generally as our carpenter's hammer. The show of specimens of journeymen's work is at the expense of the Municipal Council as regards materials. There is shown a length of soil-pipe bent round and round, and rising to about 4ft. high, with a circle of about 1ft. 6in. diameter, a very good piece of workmanship. There are also shown specimens of joints, straight and branched, in a 4in. horizontal pipe. All the joints are very clean and close together, and all overcast with iron after having been made, similar to the system followed in the North of England. There are specimens of lead-bossing, two oval back wash-basins with projecting lip, bossed out of one piece of lead; very good work. Although the work of these two classes is very good, there is, Mr. Lyne remarks, some English workmanship in Messrs. Jennings's exhibit which surpasses it—in fact, puts theirs in the shade. Messrs. Jennings (of Lambeth) show a stack of 4in. soil-pipe, two P-traps branched into same. At the side of the soil-pipe is a stack of 2in. pipe carried up same height, and branched into the P-trap as an anti-siphonage pipe. Also a stack of 1½in. pipe with branches taken from valve-box of w.c. to ventilate between trap and basin-valve. The top of each stack is ornamentally finished. It is the best piece of plumbing work in the Exhibition. In the class kept up by the masters, a student must be introduced by a master, and a fee paid for him by the master who presents him. The student pays nothing. At the same time that the student is receiving technical instruction, he is working as a labourer. When he is considered proficient, he is allowed to trade as a plumber. Students are considered efficient workmen in about seven years. In the earthenware exhibits, nothing was to be seen that is not known in England, with the exception of a French w.c., which is let down to the level of the floor, on top of which is a slab with a skirting round, and two foot-plates to stand upon. Many of the French do not use the w.c. that is fixed on the English principle. Again, their wash-basins are very small, only 10in. [diam.], and certainly very unpleasant to wash in. Messrs. Jennings (of Lambeth)—in the Machinery Hall is to be seen a combination bath-room suite, with douche, spray sitz, plunge, shower, and wave; wash-basin with movable supply, that spray may play into face, and then be reversed so as to play on top of head; also a biddie and pedestal w.c., with water-waste preventer. They have also concealed urinal with swing waste, and automatic cisterns to supply urinals. Their bath-room suite surpasses anything of the kind in the Exhibition. Messrs. Doulton of (London and Paris), have also an exhibit in the Machinery Hall. It consists of combination w.c., French w.c., instantaneous method of getting hot water for bath, interception traps, gully traps, waste preventers, automatic flushing tanks, wash-basins, and a bath. They have a similar show in the Esplanade. M. Poupard (a French firm; he is also director of the Masters' Technical Classes). —This firm show principally the goods of Messrs. Dent and Hellyer, of London. The hygienic w.c. is in French hard porcelain, which stands the frost better than the English w are.



Also optimus-valve w.c., bath biddie, and wash-basins, and specimens of plumbers' work done in the English style. They also show water-waste preventers of the same makers, and anti-D traps. Mr. Lyne also describes the exhibits of M. Flicoteause (of 83, Rue de Bac), and M. Valdo (129, Rue de Chemin), adding: The Exhibition is well fitted up with lavatories by Messrs. Doulton and Sons, with their combination w.c., water-waste preventers, tilt wash-basins, and automatic flushing-tanks; there are some fittings executed by French firms, but for convenience and comfort Messrs. Doultons' are first. In the Ville de Paris is a sanitary house, showing sanitary plumbing arrangements in a town house. In basement are shown drain-pipes, all round, lying on brickwork, above floor level, and at nearest point to sewer is an interception trap. The soil-pipe is fixed outside with iron clips in yard. There are three floors, showing w.c. on first and second, each being trapped above floor. Each w.c. is fitted with hopper basin and waste preventer. There is a 1½in. anti-siphonage pipe taken from each trap, and branched into soil-pipe above top w.c. On top floor is a bath, with waste taken down separately into gully-trap under the surface. On ground floor is a row of three wash-basins, 10in. diameter, 1½in. P-traps, which are too small for the purpose. In the unsanitary house is shown a stack of 8in. iron pipe, inside of house, with a branch showing through floor, and so used as a w.c.; no trap to sink, and no water cesspool in yard—a very good model of a fever-breeding house. The technical instruction of French plumbers is being pushed forward as quickly as possible; and it is a good thing that the technical instruction of plumbers is being pushed forward so much in England too. The French plumbers receive 7½ francs per day. They work 54 hours per week in summer, 48 in winter; no reduction of wages in winter. Average employment about nine months in the year. Wages are paid once a fortnight. The journeymen plumbers' syndicate estimate that about half of the plumbing work is done by piecework. They are against the system. The Municipal Council, when they have work to be done, sometimes invite tenders and estimates for it from the various trade organisations, to which the work is frequently given. This refers to other than plumbers' work. French workmen are, he says, a sober, industrious, persevering class of men, spending their spare time in improving themselves in their craft at the workshop of the syndicate to which they belong. The Municipal Council provides the teachers for giving technical instruction in plumbing, and finds the materials for all experiments which the plumbers desire to make. For three rooms about the same rent is charged as London workmen pay—350 francs per year. The cost of living for a family of four is about five francs per day. There is no female or juvenile plumbing labour. Mr. Lyne describes in detail the sewers of Paris, which are of great dimensions, well lighted and whitewashed, and "no more objectionable to travel through than our underground railway."

FOUR OAKS FARM, SUTTON COLDFIELD.

THIS house has recently been erected for Mr. Alexander Glenday, from the designs and under the superintendence of Messrs. Jethro A. Cossins and Peacock, architects, Birmingham. It has been built on the site of an old farmhouse, and the kitchen and scullery of the old house have been left intact, and made to serve the same purpose in the present building. The materials used for the walls are red bricks up to the first floor, and above that half-timber framing, and the roofs are covered with "Sovereign" tiles. On the same estate, and under the same superintendence, a pair of cottages and extensive farm buildings are now being erected.

SANITARY SPECIALITIES.

ONE of the difficulties experienced in every-day work by the busy architect and surveyor, when writing specifications for sanitary work particularly, is the very real one of having to turn over a variety of price-lists and catalogues in order to particularise first this item and then that, in each case having to quote the list price and exactly describe what is intended. Concise and clearly-illustrated catalogues are, therefore, of great use, while well-illustrated lists giving sizes and details very materially assist the professional man in his work, by placing the specialities they represent in a ready form for reference. Mr. Twyford, the well-known maker of the famous wash-out "Unitas" closet, has just published a new fully-illustrated catalogue, got up in a thoroughly practical shape, showing not only his "Unitas," "Deluge," and "Tornado" closets, as well as "The Crown" or cheaper basin and trap, but every form of urinals, lavatory basins, water-waste preventers, flushing cisterns, sinks, washtubs, baths, traps, gullies, grease interceptors, and other Hanley-made pottery produced at his works. Besides these, several sheets are devoted to the illustration of indiarubber connections, lavatory fittings basin plugs, cocks, brackets, &c., every one of which is handy for reference and useful to the specifier. Chromo-lithography has been used for the production of the plates of this handsome folio, so that all the decorated goods are shown in colour, thus enabling the purchaser to see the patterns, from which a choice may be made. The designs are floral, and seem arranged to suit great variety of tastes, though, for our part, we think the more simply such things as water-closet and lavatories are treated the better. Good all over patterns in blues, if colour is desired, are perhaps as effective as anything. Mr. Twyford's "Cardinal" standing waste and overflow for basins is a new feature, and besides having the advantage of being at once get-at-able, it saves the necessity of extra lead pipes and connections. The lip-drained soap-dishes now usually adopted are here also introduced. The "tip-up" lavatory used in ranges for clubs and hotels still has its admirers, and the demand for such things is here furnished with tiled backs and hard-wood inclosures. One of the most convenient forms of fitments shown in this list is the fold-up mah

gany lavatory for offices and ships' cabins, with supply tank, waste receiver, shifting mirror in a rack, and shelves for brushes and the like, as well as a pot-cupboard below. Hanging lavatory brackets are shown, which in some cases might be preferred. Hopper basins and traps for housemaids' cupboards and men-servants' w.c.'s are also illustrated in considerable variety. The combined housemaid's sink, too, is shown, with various improvements, also latrines worked by flushing tanks, for barracks, asylums, and workhouses. The trough urinals on this system for public places are also delineated, and wall tiles used for all places of this kind are provided. It will thus be seen how complete and comprehensive Mr. Twyford's new trade list really is, making a book well worth keeping for reference.

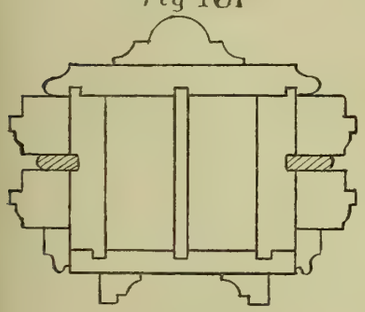
CARPENTRY AND JOINERY.—XXIII.

WINDOW-FRAMES AND SASHES.

IN square-headed sash-frames there are other varieties — two-light and three-light — and perhaps, under peculiar circumstances, there may be frames having a greater number of lights. In the two-light there will be what is known as a mullion in the centre, between the two opens, which are usually equal in size.

Fig. 161 gives a section of the mullion between the two lights. It will be noticed that it is just about equal to two of the stiles with the accompanying casings, &c., the styles being placed back to back. The weights are separated by a lining, and also parting laths. Then, on account of the casings being of double width (necessitated by the room being required for sash weights), some trimming or moulding is required in order

Fig 161



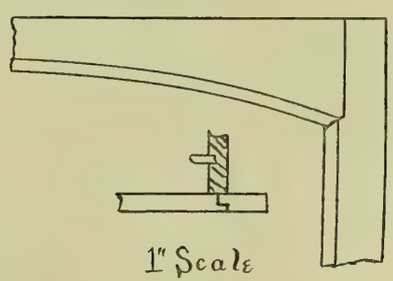
2" Scale

to avoid an excessive width of plain surface. This is shown; but it is only one of many ways of treating it. It will be understood in such cases the sill and head must be continuous the whole length required, and in frames having two or more lights it is advisable — almost absolutely essential—to tenon the stiles into the head and sill. This was dealt with at the conclusion of the preceding article, and need not be extended upon. In frames having more than two lights, whether equal or not, mullions will be required to divide the light, and will be somewhat like Fig. 161 in every case, except where all the windows are not suspended with weights; in such cases the space otherwise needed for the weights can be dispensed with. The outer stiles and casings of Venetian or other of these many-lighted windows are similar to those of single frames.

Sash-frames having segment, semicircular, Gothic, and other shaped heads have very frequently to be made by the joiner, and present rather more difficulty (some, at least) than those with square heads. The simplest form of segment-headed is when the outer casing alone of the frame is wrought to this shape, and in common property is very often seen.

Fig. 162 shows how the elevation is arranged. The stiles run up the full length, and the head is inserted as shown. The *mitre* is obtained by the intersection of the lines of moulding, and it will be noted that the head reaches over unto the stile of the frame, say $\frac{3}{8}$in. or $\frac{1}{2}$in., which gives a more solid bearing. A transverse section is also shown in Fig. 162 of how the joining of head and stile casing is sometimes made. This prevents light shining through in case of shrinkage between *side and end grain*. This joint or joining must be accurately fitted to be of use. The sash for such a frame as this would have the top rail square or level on its upper (outer) edge, and the inner edge would be curved and wrought to suit the segmental curve of the casing, showing a similar margin around the top casing to what is shown down the stiles. Sashes for curve-headed

Fig 162



1" Scale

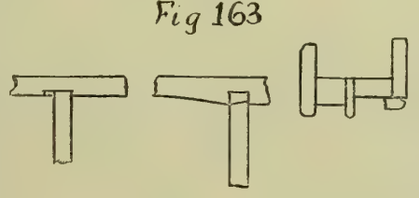
frames will be treated of as soon as the frames have been disposed of. An advance upon this method is when the head of the sash, out and in, is segmental, and the frame is made to correspond, but only as far in as the parting bead. From the parting-bead inwards of the head of the sash-frame is level or square.

Fig. 163 shows by what means a segment-headed sash-frame is made as above. Having first of all set out the segmental curve of the head, showing on the working drawing the line of the outer casing, as also that of the parting bead, if its projection beyond the inside of the head differs from that of the outer casing.

A template is got out in order to serve as a guide to work the inner curve of the head to, and this piece (curved head) is just the thickness of the sash, as may be seen in the right-hand section of Fig. 163, and will, of course, be level on the outside; but, if economy is desired in regard to timber, then, if it is $1\frac{1}{2}$in. wide in elevation, it will serve the purpose, seeing that the top parting-bead is got out curved inside, and square or level on the outer edge, and so as to be fair with the outside of the level inner part of the head of the sash-frame. This arrangement of the top parting-bead hides the piece above the top of the sash except on its under side (soffit). Having then prepared all the timber required for this sash-frame (practically there is little difference in this style of frame from a square one, only the top outer casing, top parting-bead, and the portion of the head of the frame which is above the outer or upper sash), a piece of square timber is required for the level part of the head of the frame equal in breadth to the distance from the inside of the parting bead to the inside of the stile of the frame; the thickness of the piece is optional, but may be the same thickness as the stiles.

The stiles of the frame will be checked down as far as the *springing-line* of the segment, as is seen in the middle one of the drawings figured

Fig 163



1" Scale

163, and may be bevelled as shown in this middle elevation. The left-hand illustration of Fig. 163 is that of the inside or level part of the head.

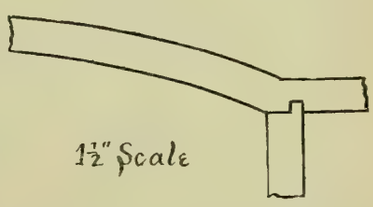
Put together the sill and stiles in the ordinary way; key and nail on the inner part of the head. The plough-groove in the stiles will be the guide in nailing the narrow piece of the head on, as it is also the guide in checking out the piece for the segment. Lay down the frame upon the bench to put the inner casings on, which will be done in the usual manner; mitre in the staff-beads or batten-slips, then put on the braces to keep the frame square, and then turn it over. Now lay on the piece which is to form the top parting-bead, and nail it, when in its right position, to the stiles and head; draw a line round this parting bead, to serve as a guide for putting on the segment part of the head. If this has been got out in one piece, the line will not be necessary. Nail on the curved part of the head, doing so firmly; put on the outer casings on the stiles, and then put in the top casing.

Having done so, a few fine hooks can be put through the top parting bead into the curved head, so as to keep both together. It is hoped that the three illustrations in Fig. 163 will be sufficient, with the explanation given, to make the matter of making such a frame clear to the reader.

The illustration on the left is an elevation of the head from the inside of the parting bead inwards. The middle one shows an elevation of the head from the parting bead to the inside of the outer casing, this not being shown in order to show the junction of head and stile, and on the right-hand side is seen a section through the head on a line continuous with the inner face of the stile. Two other methods of forming the head of a segment-headed frame, when the top is segment throughout, are: first by *building* it, that is, having it in three parts, one part being equal in breadth to the thickness of the top sash, a second part being equal to and forming the parting bead (segment, of course), and the third part being equal in breadth to from the parting bead to the inside casing. The exact widths of these may be obtained from the section of the stile, and if the stile section is similar to that shown in Fig. 156, due allowance must be made for the *tongues* required to fit into the grooves of the casings. When these three pieces have been got out and worked to the shape (the parting bead being rounded on the edge or worked to any other required outline), they are screwed or nailed together, and from opposite sides; the screws can be sunk a little. Care must be taken to keep the pieces on both sides of the parting bead in the same plane, any short piece having a straight edge and a little piece cut out to admit the parting bead will serve for the purpose of testing this. The other method of getting out the head is, having a piece of timber long enough, and thick enough, to *take it out of the solid*, then work it to the pattern, which has been got out to the outline of the head. Instructions were given for the working of curves when door-frames were treated of, and need not be repeated. If the shop is a *machine* one, the groove for the parting bead can be put in at the *upright spindle* (circular head). It would be well to run gauge-lines round with a mortise-gauge for the groove in the head, so as to lessen the risk of *spalshing*.

Fig. 164 shows how the connection is made

Fig 164



1½" Scale

between stile and head. The tongue, or *tusking*, for insertion in the head is left on the backside of the stile. A wedge or key can be put in for to tighten the style if thought advisable; but if this is done very great care is required. The reason why the tusking is left on the backside of the stile is, the top being segment, it is found when it is worked that to cut the groove or trench in the head for a tusking left on the front of the stile would be to have no strength of timber, seeing that the curve springs from the intersection of stile and head. It causes the *grain* of the timber at that portion of the head to be very short, and the least knock would break it away, whereas when the tusking is at the back of the stile, there is some strength of timber to resist. For this same reason it is not very advisable in this kind of frame to key the stile and head together. Simply nailing them together, well boring the head first, is the method which is least risky.

It is seen by Fig. 164 that the outer surface of the head is cut round parallel with the inner. This, of course, is a saving of timber in the case of a number of heads being required, and as they would be cut out at the band-saw, very little waste would occur.

The greatest objection, perhaps, to the latter method of getting out the head is the great difficulty of getting a piece of timber so thick as is required, sound, and good in other respects; it is difficult also to have it thoroughly dry.

To cut into a piece of timber of the dimensions required, and after doing so find it is useless for the purpose required, is a considerable loss; so that, except in workshops where a very select stock of timber is kept, the former of these two latter methods is the one adopted for getting out segment heads to frames—viz., that of *building them.*

Another method still may be, and rarely is, adopted—*blocking or staving;* but as this plan is more frequent for smaller and quicker curves, it is left to be dealt with under the heading of "Semicircular Frames."

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Glasgow Institute of Architects.—The twenty-first annual meeting of this institute was held on Tuesday in the Religious Institution Rooms, Glasgow, Mr. John Gordon, president, in the chair. Mr. William Maclean, secretary, submitted the report of the council. During the year one member had died, one had resigned, and four new members had been admitted, leaving fifty-one members on the roll. The Architects' Registration Bill had occupied the attention of the council during the past session. It had ultimately been agreed to recommend the Institute to co-operate with the Royal Institute in opposing the bill in its present form. Meantime, however, the Bill had been withdrawn. Generally the council had to report that the affairs of the institute were in a satisfactory condition. The treasurer's statement showed a balance in favour of the institute of £274 6s. 11d. The Chairman, in moving the adoption of the report, remarked that the Institute had now reached its majority, and those who had been original members would agree with him that during these 21 years their Institute had fairly fulfilled the intention of its promoters. They had considered and satisfactorily settled numerous questions connected with their professional practice, and they were now endeavouring by examinations and professional obligations to maintain a body of fully qualified practitioners.

CHIPS.

Dr. Heinrich Heydemann, the well-known Professor of Archæology at Halle University, died in that town on Thursday, the 10th inst., at the comparatively early age of 47 years.

About a quarter of a mile from the village of West Shefford, Berkshire, in the course of the construction of the Lamborne Valley Railway, has been discovered what appears to have been an extensive Anglo-Saxon burial place of the 6th or 7th century.

The partial strike of Messrs. Chubb's London locksmiths has terminated. Instead of an advance in the London price list, the men have accepted the arrangements proposed by Messrs. Chubb, under which they now resume work at the Wolverhampton works of the firm at the rate of pay they received in London.

The Streets and Buildings Committee of the York Corporation considered, on Tuesday, the 86 applications received for the position of city surveyor, rendered vacant by the appointment of Mr. J. E. Mawbey as borough surveyor of Leicester. The following six candidates were selected to appear before the committee at a further meeting:—Mr. John Buchan, borough surveyor, Grimsby; Mr. Alfred Creer, borough surveyor, Lancaster; Mr. H. J. Martin, deputy borough surveyor, Bradford; Mr. J. Patten Barber, surveyor of the Vestry of St. Mary, Islington; Mr. Thos. Leake, Government clerk of works and public buildings; and Mr. Henry Capner Marks, borough engineer and surveyor of Dewsbury.

The statue of the Prince of Orange, at Brixham, Devon, is to be unveiled on Tuesday, the 5th of November, and a public luncheon is to be held on the occasion. The statue, which is of marble, and has been executed by Messrs. W. and T. Wills, is to be erected near the spot on which the Prince landed November 5, 1688.

Building Intelligence.

Bristol.—The Mayor's chapel on College-green has been reopened, after restoration, carried out from the plans of Mr. J. L. Pearson, R.A., at a cost of about £4,000. The chapel, otherwise known as St. Mark's Church, dates from the early part of the 13th century; the chancel was, however, rebuilt in the Decorated period, and the tower, the sacristy, and the monumental chapel to south of nave were successive additions of the 15th century. The west front was illustrated in the Building News for March 18, 1881. The chapel underwent "restoration" in the early part of the present century, when some £5,500 was spent in marring the architectural effect of the building, in adding to the nave ornaments of a meretricious character, and in defacing with the paint-brush the elaborate carvings of the chancel. The works just completed include the opening out of an archway on the north side of the chancel and the rebuilding of the north transept in the style of the old archway, and of the windows on that side of the nave. A large window with Early tracery fills up the gable end, and this is flanked on the outside with buttresses and pinnacles. To approach this transept without going into the chancel it was necessary to reconstruct a cloister along the outside of the north wall of the nave, and for the access to that cloister use has been made of an old doorway in this north wall near the western end, which formerly led to the gallery stairs. The cloister also forms a communication to the east of the transept. This vestry is an addition to the church, and under it a vault is built for the heating apparatus. The debased porch at the west end of the nave has been removed, and a new doorway has been inserted, with arcades on each side of it. The former internal porch and gallery have also been done away with, and a flight of steps the full width of the nave arranged descending into the church, thereby increasing the accommodation. The fittings have all been removed and the floor lowered, and the additional height has added much to the internal effect. The west window has been restored inside and out, buttresses at the west end have been made good, and new copings, parapets, &c., added to the gables and walls. The clear glass which formerly filled the west window has been taken out, and cathedral glass has been substituted. The exterior of the east end of the church has been extensively restored, including the massive buttresses there, and the east window, which was in a very decayed condition. Other parts of the exterior have also been repaired. The western end of the new cloister is now somewhat dark, owing to the windows that have been provided being still blocked up, but these will eventually be opened up. In proceeding with the windows on the north side of the nave, it was discovered that the inside jambs were continued down to a string-course which partially existed. The rude masonry which filled up the lower part of these windows, upon being removed, brought to light all that was necessary to make a complete restoration of these unique windows. The change which this work has produced in the appearance of the church is very remarkable. The windows corresponding with these on the south of the nave have also been restored, and brought down to the same (their original) level. The three-light north-east window of the nave is temporarily filled with cathedral glass—the subject being "The Ascension." The four-light window is to be filled with stained glass at the cost of the Mayor. It will illustrate scenes in the life of St. Mark, but the figures of the four Evangelists will also be included. When these have been completed the whole of the windows on the north side, both new and old, will be filled with stained glass. The whole of the old plaster has been taken off the walls, and where the latter were originally intended to be plastered new plaster has been put on, but where the masonry formed a finished surface it has been cleaned and partially refaced. A new floor of tiles has been laid down in the chancel between the stalls. The nave floor has also been relaid with tiles and wood blocks. Stalls have been added to the chancel, and the lower part of a screen has been placed on the step at the entrance to the chancel. A new pulpit carved in teak, with entrance from the chancel side of the screen, is included in the scheme, but is not yet completed. The seats for the Mayor and Corporation are arranged on each side of the nave, are constructed of teak, and have some carving upon them. A complete system of heating by hot water has been introduced. Messrs. W. Cowlin and Sons, of Bristol, have carried out the whole of the works, and the carving, both in wood and stone, has been executed by Messrs. Davey and Bushell, of St. Michael's Park, Bristol.

East Teignmouth.—The church of East Teignmouth occupies a conspicuous position at the east end of the Den. The "sham Norman" church which had been erected some 60 years ago (replacing a small genuine Norman one) was unworthy of its position; consequently steps were taken, first by the late vicar, to rebuild the chancel, to remove some of the galleries, reseat the church, and to fill the windows with new tracery. The present vicar decided to carry on the work further by rebuilding the poor modern stuccoed tower (74ft. high) and the west walls of the aisles, so as to make the west front complete. Plans were prepared by Mr. R. Medley Fulford, of the Close, Exeter (the architect also of the former alterations in the nave and aisles). The old tower has been demolished, and the best of the old stone has been used again in the new walls. The new tower is of limestone, with a plinth of dark red Kingsteignton stone, and dressings of Doulting stone. The face of the walling is finished in boasted work. The tower is about 28ft. square externally from buttress to buttress. The height to the battlements is 85ft. 6in., and 111ft. to the vane on the turret. In the tympanum over the west doorway is a figure of St. Michael, the patron saint of the church. The style of the work is Decorated. The cost of the present work is about £2,500.

Manchester. — Considerable additions and alterations have been made in the Arts Club premises in Albert-square, and the whole of the rooms have been redecorated. The club now consists of a large smoke-room, dining-room, private dining-room, and committee-room; billiard-room for two tables, card and dressing-room, as may be required, lavatories, w.c.'s, &c.; bar, manager's sitting-room and bedroom, service-rooms, &c. There is a spacious corridor on each floor communicating with the staircase hall, which has been inclosed for the private use of the club. Dinner lifts have been provided from the kitchen, which is on the upper floor, to the service room on the second or dining-room floor. The smoke-room on the first floor has been materially increased in size. The decorations and furnishing have been carried out by Messrs. Kendal, Milne, and Co., and the constructive works by Messrs. Southern and Sons, under the superintendence of the architect, Mr. William Dawes, of Cooper-street, Manchester, and London.

Oxford.—Mansfield College, a development of Spring Hill Congregational College, Birmingham, was opened on Monday. It has been erected from designs by Mr. Basil Champneys, M.A., on a site close to the Cherwell and at the back of the gardens of Wadham College. The style is Edwardian Gothic, and the building consists of a long, low central building, with an octagonal central tower and two wings, forming three sides of a quadrangle. The western wing consists of the residence of Dr. Fairbairn, the principal, and the library, which has timbered roof and mullioned windows. The central building, the southern block, comprises classrooms and lecture rooms, a junior and senior common room, dining hall, lavatory, kitchen, muniment room, and so forth. The college chapel forms the eastern wing. Mr. Bridgeman, of Lichfield, is engaged upon a series of oak stalls and canopies, and on a carved front for the organ, which is being built by Vowles, of Bristol. The chapel consists of a lofty nave and narrow side aisles, separated by arcades supported on stone columns, adorned by a series of full-length statues of illustrious divines and Protestant heroes—Wycliffe, Luther, Cartwright, Knox, Calvin, Hooker, Owen, Baxter, Howe, Dr. Watts, Whitefield, Wesley, In the tower of the chapel is a figure of John Bunyan. At the door are statues of Origen, Athanasius, and Augustine, while in the college tower is one of John Milton. The roof of the chapel is a barrelled vault. The builders are Messrs. Parnell and Sons, of Rugby, who built Keble, and the clerk of the works is Mr. Stephe Kemp. The college has been about two years and a half in hand, and, including the land, it has cost thus far something like £50,000.

Padiham.—Extensive alterations at Britannia Mills, Padiham, have just been completed, at a cost of about £14,000. The weaving shed roof, which was supported by over a hundred pillars, has been replaced by one on thirty pillars, built on the latest principles. A new engine-house, 50ft. high, has been erected for an 800 horse-power vertical engine. The whole of the work has been completed within two months, under the personal supervision of Mr. James Bertwistle, F.S.I., architect, of Blackburn; Mr. J. Thompson acting as clerk of works.

Tamworth.—The new Municipal Buildings were opened on Tuesday week. The edifice contains a large assembly hall or ball-room, 90ft. in length and 40ft. in width, with general, ladies', and gentlemen's retiring rooms; also a supper room, 36ft. by 24ft. The hall is approached by three doors through a vestibule at the end adjoining the new street. There is also a separate carriage entrance, communicating with a corridor running the entire length of the hall, from which are doorways leading into the vestibule and the side of the hall. Another corridor connects the hall and supper room with the caretaker's house, in which are kitchens and other conveniences. The hall has an open roof of pitch-pine, having six pairs of principals with elliptical ribs. The buildings are in the style of the Italian Renaissance, faced with Heather red bricks enriched with Hollington stone dressings. The large pediment over the main entrance contains a carving of the Borough Arms, 20ft. wide (a Fleur de Lys on a shield supported by mermaids). All the rooms are heated by hot water, coils being placed in the supper room and corridors, and pipes under the floor in the large hall. The architect is Mr. Nicholas Joyce, of Stafford, whose design was selected in a limited competition. The general works were executed by Messrs. Thos. Lowe and Sons, of Burton-on-Trent, whose contract was £2,745. The carving was the work of Mr. Bridgeman, of Lichfield.

Wymonbury.—The parish church of Wymonbury, Cheshire, has been reported upon as too dangerous to be used for worship; it is of Debased Gothic character, and has been built on an unstable clay foundation. Recently Mr. Ewan Christian inspected the building, and named a sum for its rebuilding, which was considered by the parishioners quite beyond their means. An adjourned vestry meeting was held on Wednesday week. A letter was read from Mr. Walter M. Boden, diocesan architect, of Chester, who wrote:—"I have read with much interest Mr. Christian's report, which differs little from my own in its description of the present state of your unfortunate church. His estimate of the cost of restoration, however, is absurdly high, and he evidently wishes to perpetuate the present high and unsatisfactory pile. Rebuilding is the only safe and satisfactory way out of your difficulty." In a second letter Mr. Boden said that if it were desired to restore as much of the structure as possible, it would be necessary to rebuild the chancel, going down to a solid bottom, and also the west front, at outlays respectively of £1,500, and £500; the consequent alterations to floors and roofs would raise the cost to £2,250. A letter was also read from Mr. Thomas Bower, architect, of Nantwich, who recommended underpinning and tying of the walls together with iron, at a cost of from £2,000 to £2,500. Mr. Beckett, builder, of Hartford, said the east and west ends were quite hopeless, unless they were underpinned. A committee was appointed to make further inquiries.

COMPETITIONS.

The Burns Statue for Ayr.—Twelve competitive designs have been received for the Burns statue to be erected at Ayr. They are being exhibited in the town during this week. Mr. H. Thorneycroft, R.A., London, is to advise the committee.

During the excavations now going on beneath the Guildhall Art Gallery the foundations of the ancient Guildhall Chapel have been revealed by the workmen. The walls are made up of Kentish rag and rubble. In the trenches dug to reach the maiden soil Roman tiles have been found. The chapel was built in the reign of Henry VI. Though injured and defaced at the time of the Great Fire in 1666 it was not destroyed, and was subsequently restored. Later on the chapel was utilised as the Court of Requests. Its final destruction took place in 1822 to make room for various law courts.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Received.—L. and D.—S. L. B.—G. G. H.—A. and Son.

Andrew Low.—(No, they are practically the same thing; but there is a great difference between *two* inches square and two square inches, as you may see for yourself if you plot them down on paper. A surface containing two square inches measures two inches in length by one in breadth; a surface two inches square of course contains four square inches.)

Correspondence.

ST. ALBAN'S CATHEDRAL.

To the Editor of the Building News.

Sir,—By this time the public ought to be tolerably well versed in the subject of restoration, as to what is orthodox and what is not, and able also to discriminate between the various shades and niceties which distinguish it from the kindred processes of alteration, rebuilding, substitution, &c. If not, it cannot be for want of sufficient dissertations upon the subject. Your leader of last Friday week again traverses the old ground; and as St. Alban's Cathedral forms, in the main, the basis of its remarks, I cannot forbear, as one perhaps better acquainted with the true state of things than most of your correspondents, adding a few remarks thereon. The general tone of that article undoubtedly leads one to a conclusion that no one can challenge as to the correctness of the views maintained; indeed, when treating of such a subject in the abstract, and especially where the ground has been so repeatedly trodden, it is hard to avoid the expression of views that have become commonplace, and therefore tolerably safe from criticism. In the present case I really fail to see that you enunciate any general principles adverse to those upon which Lord Grimthorpe has carried out his noble work at the Abbey. In other words, from a very full knowledge of what the pile was at the time our late firm (Longmire and Burge) first took up the work under the faculty committee, and since then under his lordship, I say most distinctly that your article here referred to could not better propound the general feature of the works carried out, and the lines upon which his lordship has prosecuted his self-imposed task. (It would here take too much space to quote the passages alluded to, but they constitute generally the second and third columns on p. 445.)

This brings me to notice especially one remark which I feel is pregnant with truth, and, if I mistake not, is destined yet to have a much wider application. I rejoice to find that in considerably less than even 10 years, "the hand of time has toned down the west front," and that, notwithstanding all the severe strictures passed upon it for years past, it would not now appear quite so bad after all. May we really think that the current of public opinion is beginning to veer round, and that the standpoint of censorious criticism is a shifting one, travelling from the out to the inside, thence round to the south transept, then the north, and so on? Thus, Sir, I doubt not, it will be to the end of the chapter, bequeathing to future generations the honour of appreciating and admiring the noble generosity which has saved from ruin that which all are agreed to regard as a national and historic memorial; indeed, but for the timely help of its benefactor, no one who knows the Abbey intimately can doubt that portions of it must either have been, as you graphically describe it, "left on crutches for the admiration of antiquaries," or left for the ravages of time to effect its utter ruin. Certain it is that no system of "voluntary subscriptions" could ever have coped with the necessities and urgency of the case, seeing that it took some 38 years in which to raise and expend £18,500, to say nothing of the odious task and ceaseless anxiety connected with such collection of funds. As to why Lord Grimthorpe did not retain the services of an architect in so important a work, it becomes me to say but little, although at pp. 50 and 51 of "St. Alban's Cathedral and its Restoration" some light is thrown upon the subject, and there is no concealing the fact that in it, principally, lies the gravamen of the professional irritation that exists. I grant most fully that there may be fair ground for architectural criticism, yet even that is no reason why our eyes should be blinded to every generous consideration, which might well find some place even in this unhandsome controversy. A great deal has been made of the fact of his lordship being but an amateur, as distinguished from a professional architect, and it is a singular coincidence that in this week's "B. N." you report a lecture delivered by Professor T. Roger Smith on "Sir Christopher Wren and his Architecture," where I learn for the first time (I confess my ignorance) that that great man was likewise an amateur in the same sense—allow me to quote: "It would be easy to expand the evidence as to Wren's having become eminent in science, and it is not difficult to see how he became so. Curiously enough, it is not equally clear how he became an architect." I have no wish to strain the point, but such a precedent is not here wholly without value, and is suggestive of certain truths. Consciousness alone of trespassing on your space forbids my mentioning some of our best modern works and their architects, and asking, "Did they escape hostile criticism?" Nay, there are plenty living who must have keenly felt its influence; then, if doctors themselves suffer smartly at times at the hands of their brother professionals, what is a layman to expect? Nor can one doubt but that even among professional men there are many who would shrink, and very naturally, from the responsibilities entailed in the handling of such a work as St. Alban's Cathedral even if it came to them.

In conclusion, and this is the pith of my letter, I would beg of any who contemplate signing the proposed memorial to the bishop, churchwardens, &c., to pause first, and, if practicable, go there, see what has been done, and then draw their own conclusions, rather than be led entirely by the loud voice of a few gentlemen who almost appear to constitute themselves as the mouthpiece of the whole profession and the British public into the bargain. Should that petition be persevered in, I sincerely trust it will not receive any official countenance from the R.I.B.A., and I further trust that some gentleman of position and influence will frame a counter-petition embracing all that is necessary to prevent obstruction to such a good work, and that it may thus be handed down to posterity as a monument of large hearted munificence, the pride of Englishmen in general, and Churchmen in particular. I wonder which petition would be most numerously signed!—I am, &c., Charles William Burge.

38, Boundary-road, N.W., Oct. 10.

THE MEMORIAL ANENT THE DESTRUCTION OF ST. ALBAN'S.

Sir,—Your correspondent, "W. H. R.," it seems to me, is in the category himself with those he condemns who "write for the sake of writing," and do nothing more. What has "W. H. R." done to further the cause of preservation? Has he obtained from Mr. Hugh Roumieu Gough a sheet of the Memorial and got it filled in with the names of people distinguished in art and literature, with clergymen, M.P.'s, and other dignitaries? If not, the sooner he sets about it the better. Mr. Gough deserves great credit for his efforts in this direction, and everyone interested in our national antiquities should sign, and get signatures for the before-mentioned memorials. It is the only thing which can be done by us to stay the destroyer's hand.

It is no use to look to the R.I.B.A.: the Institute made a *faux pas* once, and will not move again.—I am, &c.,

M.

Sir,—I was delighted with "W. H. R.'s" letter in your last issue. At last the right note has been struck. This endless cavilling and mere provocation must be a source of great amusement and self-satisfaction to his lordship, as he quietly pursues his work of destruction with the most unswerving obstinacy. It is clear no force of argument will ever convince one who has gone so far. Even now, for the sake of this much-spoiled but priceless abbey, something more definite must be done to save it from utter ruin. The R.I.B.A. should be brought to see their responsibility in the matter, and that it is their duty as a body to issue an ex-cathedrâ condemnation of the work—for I presume they can have no sympathy with Lord Grimthorpe. If they have, they are unworthy the name of architects.

Mr. Gough has a petition in hand; but I fear that, signed by all sorts and conditions of men, it will only add to the amusement of Lord Grimthorpe, and go the way of all petitions.

No, the right and only course now is to petition the profession as a body to issue their fiat, and then woe to Lord Grimthorpe if he still holds on his way! At least our architects will have done their duty, and our countrymen will have no cause to blame us (for they will when the work is complete, and rightly so too) for not doing our best to stop one of the most dastardly pieces of Vandalism extant.—I am, &c.,

Oct. 14. Carpe Diem.

MR. HEMS AND ST. ALBAN'S.

Sir,—Mr. Harry Hems is too exacting. Never having mentioned his son in your columns, nor even knowing of his existence, except through the "B. N." I, of course, made no public charge against him, and so have none to withdraw. To show up the public shortcomings of public men in public matters is not to "vilify" them; the "B. N." abounds with protests against mistaken restoration, and only last week I saw a church (Barford, Salop) which I have known these twenty years, now beautified out of knowing by Mr. Aston Webb. Mr. Hems evidently thinks that architecture and sculpture are parts of the "building trade"—no wonder his works are mediocre; and as he seems to think that anyone, however unconnected with trade or profession, who criticises his works must have some sinister motive, it is little wonder if others believe the puffs which appear in the papers are written by himself. At any rate, no other firm that I know—Earp, Brindley, Rattee—resort to such tricks.

But for having to write this letter I should never have noticed the tissue of falsehoods about me written by him in the "B. N." of Sept. 13. He says there (1) that I am not the author of my own letters; (2) that I am dependent on someone else that for what I write; (3) that trade feeling has stepped into my letters; (4) that on March 14, 1889 (*or any other date*) I (5) a little (6) lawyer (7) accompanied by one Cabron (8) scaled his hoardings intending mischief, and (9) was caught by his son. Every proposition that I have figured is *absolutely false*. Does Harry Hems imagine that such silly spite will ingratiate him, e.g., with the Dean of Winchester or Mr. Pearson? Why, Sir, the other day it was not his, but Earp's, men I found at work, even in Blomfield's big church at Portsea.

I think I once before said that "he had travelled much and seen little." Whether he knows them or not, the windows at Beverley, Worcester, and Doncaster tower are there, treated like the south transept of St. Alban's, and "it is this 'Architect of Forty Years' Standing' who seems utterly ignorant of architectural matters." I am sure the well-known firm who put up the Beverley screen will thank him for his suggestion that they scamped their work.

Mr. Gough's "petition" contains what looks like a wilful falsehood—viz., that Lord G.'s faculty covered only the west front. He knows very well that it extended to the whole church, with the possible exception of the Lady-chapel, which has to be decided.

Albanians will hardly thank him for trying to stop the £100 weekly spent in wages in that not very flourishing city, and all, I believe, because Lord G. would not take up his Registration Bill. And now, Sir, again thanking you for the space you have given an old subscriber, I take leave of the matter until, as I said before, a fresh crop of Albanian myths grows up.—I am, &c.,

W. H. M. Ellis, M.A. Cantab.

CHIPS.

The parish church of Treflys, South Carnarvonshire, dedicated to St. Michael and All Angels, was on Friday reopened after restoration, from the designs of Mr. Henry Kennedy, of Bangor.

Memorial stones of a new Wesleyan chapel at Upper Poppleton, near York, were laid on Thursday, the 10th inst. Plans for the building were drawn by Mr. C. Anderson, architect, the cost of the structure being placed at about £800. The front of the building, which is Gothic in style, will be of white bricks, with dressing of Whitby stone. The dimensions will be 40ft. by 23ft., and the chapel will seat 165 persons. The roof and furnishings will be pitch-pine, and the building will be heated on the hot-air principle. Mr. J. Simpson, of Priory-street, York, is the contractor.

At the annual meeting of the Society of Medical Officers of Health, held at the Holborn Restaurant, London, on Friday, Mr. Henry E. Armstrong, medical officer of health for Newcastle-upon-Tyne and the River Tyne Port, was elected president for the ensuing year. This is the second occasion on which the office has been conferred on a provincial medical officer of health, the first being that of Dr. Hill, of Birmingham, in 1886.

The local board of Consett are about to carry out works of sewerage from plans prepared by Mr. R. Robinson, of Darlington. The sewage will be dealt with by irrigation on Consett Park and Stamfordham farms, just purchased by the board as sewage farms.

On Friday memorial stones were laid at a new Wesleyan chapel which is being erected on Windmill-hill, near Bedminster railway station, Bristol. It will accommodate from 200 to 250 persons, and the cost will be about £550. Mr. George Elmers, of Bedminster. is the builder, and Mr. Herbert J. Jones, M.S.A., of Bristol, the architect.

The new chapel attached to St. Mary's (Franciscan) Abbey, Mill-hill, was opened on St. Francis' Day. The style is simple Gothic, the walls being of red brick, faced with white stone, in order to harmonise with the convent buildings, which are the work of the same firm of architects, Messrs. Goldie and Child. The roof is of slate, the low tower, which has been fitted with a set of bells, coming immediately over the sanctuary. The church has been interpolated between the convent and the Girls' Industrial School, which are connected by a covered cloister running round the garden side of the church. Inside the church the walls are entirely faced with white bricks. The nave seats 200 persons.

The American Elevator Company, London and Paris, have been awarded a gold medal for their standard hydraulic elevator exhibited at the Paris Exhibition, and a further gold medal has been awarded for the elevators supplied by the same company working in the Eiffel Tower.

The Bishop of Wakefield dedicated on the 10th inst. a lych gate, which has just been erected at the entrance to Outwood Churchyard as a memorial to the late vicar. The gate is built of Robin Hood stone, with folding gates of oak. Mr. W. Taylor, of Outwood, was the contractor for masonry.

The memorial to the late Mr. Beamont, the well-known antiquarian writer of Warrington, will take the form of a bronze statue, to be erected in front of the town-hall of that borough.

The chancel of Torpoint Church, Devon, having been decorated by Messrs. Fouracre and Son, Stonehouse, Plymouth, and other improvements made to the edifice, reopening services were held last week.

The new Congregational Church at Great Harwood, Manchester, was opened on Saturday. It affords accommodation for over 600 seat-holders at a total cost of £3,000.

Intercommunication.

QUESTIONS.

[10116.]—**Copper Roofs.**—Is there any acid that will turn the copper of roofs the much-coveted verdigris colour without injury to the metal, or must it be left to time alone to produce it?—Sunshine.

[10117.]—**Certificate.**—Required a form of approved certificate that the drainage of a house is efficient, and that the drains and soil-pipes are effectually ventilated.—G. C. B.

[10118.]—**Housing of the Poor.**—I should feel obliged if one of your readers would let me know how the poor are housed in the principal cities of France and Germany, or where such information might be gained?—S. W.

[10119.]—**Ordnance Datum.**—Will "G. H. G.," or some other correspondent, kindly say what is the "Ordnance Datum" generally used in the practice of levelling, and also name a good and inexpensive book on levelling? I have Baker's "Land Surveying."—H. H., Bath.

[10120.]—**Concrete Houses.**—I should feel obliged if you or any of your readers could inform me as to the best works on house-building with concrete, authors and prices.—Scott.

[10121.]—**Main Sewer.**—Will some of your correspondents kindly answer me the following question? I myself and other parties are building some houses on the side of a main road, which is a continuation of a main street out of a town, and close to the town. The main sewer turns off at the end of street, and we have no sewer in this road. So far the houses have been drained into cesspools; but it does not answer. Who is liable to be at the expense of putting in a main sewer for the purpose of taking away the drainage of these houses, the town authority or the several owners of the houses?—Drainage.

[10122.]—**Domestic Hot-Water Supply.**—Is there any extra strain in range bath-boiler when the water is boiling in hot cistern placed in bath-room over kitchen, and the steam escaping by ¾in. blow-off pipe at roof?—Teachable.

[10123.]—**Double Floor Boarding.**—When it is essential to lay the two layers separately—viz., the lower one of undressed boards before the plastering is done, and the upper layer of dressed boards afterwards,—what is the way to cramp and render close-jointed the upper exposed finished surface?—Schemer.

[10124.]—**Prime Cost.**—What is the meaning of prime cost when a lump sum is put in a specification? Does it leave it optional for the architect or proprietor to obtain the article at the price stated without entertaining any claim from the contractor for customary profit?—Fairation

[10125.]—**Earthworks.**—Will any reader of the Building News, having experience, kindly explain the correct method of measuring excavating and mounding, the sides or slopes of excavations being at an angle of 45°, the form of section a truncated prism; and the sides on slopes of mounding also at the same angle, with internal and external corners (the plan is ⌐ shape). If measured nett should not extra be allowed for labour forming slopes and angles, or, what extra mounding and excavation should be allowed to meet this (if any) and how measured? A reply in next week's issue will oblige.—Doubtful.

[10126.]—**Sanitary Inspectorship.**—Can one of your many correspondents suggest the best manner of a young carpenter qualifying for a sanitary inspector?—A. C.

REPLIES.

[10084.]—**Heating Glasshouse.**—If the glasshouse is contiguous to a kitchen, the circulating pipes from the boiler behind the fire (where it will admit of the arrangement) might be made available; or a separate gas-stove for heating the hot water circulating piping might be adopted, the stove being fixed external to the glasshouse—at least, so far as access to lighting is concerned, and a special tube should be provided for disposing of fumes.—Tolop.

[10094.]—**Projecting Eaves.**—The sooner "Lancashire" gives notice, and sees to the projecting eaves-gutter or trough being removed, the better for his own peace of mind and those who follow him, as otherwise a right to same, as well as "eaves'-droppings" might be gained by time as an easement.—Tolop.

[10108.]—**Building Line.**—The instance quoted by "A Builder" of a Local Board wishing to keep buildings 100ft. from a road where he wished to set back 20ft. is only a sample of what will now continually arise under the Public Health (Buildings in Streets) Act, 1888, seeing that every Local Board has now the power to prevent any one owning land building in front of the line of buildings on either side thereof. If we take almost any street, or suburban road, laid out 20 or 30 years ago, where the land belonged to different owners, we find instances where Local Boards are now in a position, if they choose, to inflict great injustice upon owners of vacant plots of land without the owners having any power of appeal. The new Act ought to be immediately amended, so as to give owners the right of appeal against the decisions of the Local Boards either to the Local Government Board or the County Councils, when the Local Boards attempt to act unreasonably. The public certainly needed more protection than the old enactment gave; but that might have been achieved without putting individual owners in such an invidious position as they will now find themselves in many instances. During the few months that the Act has been in force I have met with several cases where it has been applied in a way that owners of vacant plots have had reason to feel that their interests have been sacrificed unreasonably for the benefit of adjoining property-owners (whom they have fancied must have had friends upon the Local Board) without the public being any better for the sacrifice. As the law now stands, an owner must either respectfully submit to the behests of

the dozen of gentlemen who form the Local Board, or, rather, a majority of that number, although he may know that in the course of a year or two that authority may be so constituted as to entirely reverse the policy of the powers that be; or, he must submit to lose income from the land until he can hope to receive more favourable, or, as he may think, more reasonable treatment.—Practical Legislation.

[10110.]—**Smoky Chimneys.**—A much better position for the door to No. 1 room would be to alter present opening to the other corner of the room on same side to passage as now, for, as it is shown, the air blows across fireplace instead of into it. The room being small, and it is desirable to keep the door shut, a special inlet for fresh air ought to be provided from the exterior, so as to render the draught good, and make it independent of air from passage.—Tolop.

[10110.]—**Smoky Chimneys.**—The plan of the two rooms furnished by "J. S." presents a useful lesson to young designers as to what to do and what avoid. The larger room shows the fireplace, the windows, and door in their best relative positions. The comfort and use of the small room is destroyed by the wrong position of the door, which ought to be as far from the fireplace as possible. The rationale of the diverse action of flues is this: The larger room has the door away from the fire, the said door having the advantage, so far as the fire is concerned, in being close to the outer door, so that even when the door is shut sufficient air forces itself in by door and windows to fill the room and feed the fire—the life of the fire being as dependent on oxygen as that of a human being. Air being properly supplied and the room space kept full, the fire burns aright, and no smoke descends. In the othes case there is less supply of air outside the door, for the staircase will act as an updraught, and if the room near is a kitchen, that will also be injurious, so less air will get in when the door is shut than in the other case, and what does enter goes at once to the fire, so that the room is left in vacuo. The shutting of the door, too, withdraws from the fire its stinted aliment. As the ancients said, "Nature abhors a vacuum," the room is almost empty of air, and the heavy atmosphere outside descends to fill the void—the fire without food being too weak to make an updraught in opposition thereto. The remedy is to put the door as far as possible away from the fireplace, and admit the external air by a Tobin's tube, or some other device opposite the door. Good joinery, I beg to observe, militates much against the action of flues. I have supposed that the flues and fireplaces in the two rooms are similar, so that if one acts properly the other should. The causes of smoking chimneys under which the general law operates are numerous and diverse. The small simple grates now in vogue frequently require curtain pieces along the top, as too much cold air is admitted above the fire.—M.

[10110.]—**Smoky Chimneys.**—It seems probable that the fire of No. 2 room obtains a sufficient supply of air from its proximity to the external door. The supply of air to the fire in No. 1 room appears to be insufficient, and might readily be increased by an inlet-ventilator, or by an air flue driven direct to the fireplace.—G. C. B.

[10110.]—**Smoky Chimneys.**—I advise "J. S." to have the flue of room No. 1 carefully cored, as it is possible that it is choked by scraps of mortar or a brick; then see if the chimney is high enough to prevent downblow. The door being so close to the fireplace, when it is opened there is an immense current of cold air, which rushes up the chimney.—H. L.

[10111.]—**Cast-Iron Pillars.**—The best book on this subject is "Civil Engineering," by Professor Rankine.—H. L.

[10112.]—**Timber and Joinery.**—In the ordinary way the specified sizes in carpentry would mean the sizes minus the waste caused by the saw-cuts; but if the specification states "finished sizes," when fixed, an allowance must be made. In joinery, a 1½in. door usually measures 1⅜in.—H. L.

[10112.]—**Timber and Joinery.**—Timber and deals not wrought should be specified to hold the full thickness described or figured on the drawings. If wrought I invariably specify that one-tenth of an inch will be allowed for each wrought face on the several specified scantlings or thicknesses. The custom mentioned by "Windsor" may at one time have been a local one; but it certainly has never been general or binding.—G. C. B.

[10114.]—**Floor Stiffening.**—I consider that the herring-bone strutting should be completed before the floors are laid, and, moreover, that a very careful job should be made, so as to thoroughly stiffen the joists.—H. L.

[10115.]—**Stanchions of Cast-Iron.**—See answer No. 10111, on the same subject.—H. L.

The new buildings connected with the Ripon Free Grammar School, erected from the designs and plans of Mr. Geo. Corson, of Leeds, architect to the Leeds New Infirmary Buildings, were opened on Thursday week by Lord Ripon. In the tower a large clock with two 6ft. 6in. dials and quarter chimes had been made and fixed by Messrs. W. Potts and Sons, the well-known clockmakers from Leeds, whom we understand have obtained the gold medal at the present exhibition at York for the superior quality of their workmanship. The Marchioness of Ripon, after a few remarks from the head master, started the clock on what is to be hoped will be a successful career.

The foundation-stone of a new district church for the suburb of Highcliffe, Winchester, was laid on Friday by Earl Northbrook. Two western bays of the permanent building are being built. Mr. J. L. Pearson, R.A., is the architect, and Messrs. Shillitoe and Sons, of Bury St. Edmunds, are the builders. The work is being carried out in chalk, faced with flint, red bricks being used for dressings and stone for the piers.

WATER SUPPLY AND SANITARY MATTERS.

Morley.—The corporation of Morley, near Leeds, has under consideration a scheme of water supply, prepared by Mr. Gott, C.E., of Bradford, by which it is proposed that the water shall be brought from Withen's Clough, Cragg Valley, which lies between Sowerby Bridge and Halifax. By gravitation the water would flow through twenty miles of pipes to the present storage reservoir at Bruntcliffe, which is capable of holding 1,500,000 gallons. The proposed watershed is 1,200 acres in extent. A reservoir would be formed in Cragg Valley, with a capacity of 300,000,000 gallons. Taking into account the quantity of water sent away as compensation, this would, with a consumption of a million gallons a day, be equal to a two-hundred days' supply. In its deepest part the reservoir would be 60ft. deep. The ground where it is suggested the reservoir should be formed is 900ft. above the sea-level, whilst the storage reservoir at Bruntcliffe is less than 600ft., so that there would be a clear fall of 300ft. The estimated outlay on the scheme is £85,000. Hitherto Morley has been supplied with water at a rental by Leeds.

Pontefract.—On Thursday the 10th inst, at a meeting of the town council, an important report as to the progress of the waterworks at Roall was received from the engineer, Mr. George Hodson, M.Inst.C.E., of Loughborough, Leicestershire. The results already arrived at, in the interval since the turning of the first sod on the 25th July, have fully confirmed the anticipations entertained by the engineers. At a depth of 14ft., the water was struck in the red sandstone rock on the 20th August. Since then the depth of the well has been increased to 65ft., and the inflow of water is steadily increasing. The engineer is now taking steps to isolate the water supply from surface contamination.

Tayport Sewerage.—The Commissioners of Tayport, near Dundee, recently advertised an open competition, and they finally selected a scheme designed by Mr. W. H. Radford, C.E., of Nottingham, as the most suitable and practicable for the sewerage of their district. The scheme consists of a system of pipe sewers gravitating to two sea outfalls in the Firth of Tay. Advantage is taken of the natural falls of the district, and the sewage can be discharged at all states of the tide. Ample inspection, ventilation, and flushing arrangements are provided. Mr. Radford will be engaged to superintend the works.

A new chapel is now being erected at Heckmondwike, in Yorkshire. The building, which is in the Classic style of architecture, is expected, when completed, to be one of the finest in Yorkshire. The carving, of which there is a considerable amount, includes a number of very large Composite capitals, and has been intrusted to Messrs. Howarth Bros., of 273, 275, and 277, Stretford-road, Manchester, the contractor for the stonework being Mr. Milner, of Mirfield, and the architect is Mr. Stott, of Heckmondwike.

During some excavations in the process of building at premises at St. Lawrence, Canterbury, the workmen have come, at a depth of 8ft., upon a layer of soft earth, filling a place which had previously been hollow, and in this has been found a large vessel, a Roman sepulchral urn, of dark red ware, which contained some bones. The spot lies at the top of the old Dover road, along which remains of Roman and Saxon interments have frequently been found, and occupies the site of a Leper Hospice, founded in the 12th century by the Abbot of St. Augustine's.

Additions and alterations are being carried out to Plas Uchaf, near Abergele, a shooting box belonging to Mr. D. Scott, of Manchester, by Mr. F. Butterworth, of Blackley, from the designs and under the superintendence of Mr. William Dawes, of Manchester and Oxford Circus-avenue, London. The additions include new entrance hall, dining-room, morning-room, kitchen, scullery, bedrooms, verandah, &c. Provision is also made for a future conservatory. Messrs. Bradford and Co. are the contractors for the boiler-heating pipes.

A villa now being erected for Dr. Thomas Pigg on the Bellagio estate, from the designs of Mr. William Dawes, Oxford Circus-avenue, London, and Cooper-street, Manchester, is approaching completion. It is in the Old English half-timbered style, and is roofed with red tiles. The walls are of red brick and the dressings of stone from local quarries. The half-timbered work begins at first floor, and is here and there broken up by tiling and the brickwork of chimneys. Mr. Alfred Foster is the contractor for the work.

Mr. Samuel Elliott, of Newbury, has been awarded a silver medal at the recent Paris Exhibition for his patent perfect simplex weather bar, wood moulding, electric wire casings, &c.

LEGAL INTELLIGENCE.

District Surveyor of St. Giles-in-the-Fields v. Sandon.—(Bow-street Police Court, before Mr. Bridge, 4th October, 1889. Recovery of Fees under Section xxvii. Rule 2 and 3.)—It appeared that the defendants, for whom Mr. Morden appeared, had erected residential chambers and shops on the site of five houses in Hart-street and Museum-street, consisting of four shops with separate entrances fronting in Hart-street, and a set of chambers with entry in Museum-street, and a similar set of chambers next St. George's Church. The chambers to main building consist of ten separate sets of chambers entered from Hart-street, with one staircase to the different floors, and the area of the building exceeded 3,600ft. The fees claimed were on each separate set of chambers or rooms, and amounted to £56 5s. The defendants claimed that under Section xlix. only one fee should be allowed, being but one building, although divided by fireproof divisions, and one notice given for the whole. The magistrate decided that the district surveyor's contention that each separate set of chambers and shops must be deemed a separate building under Section xxvii. Rule 2 and 3, and the charge of a fee for each separately, was correct. He, therefore, ordered that the full amount of the claim be paid and costs.

Hoardings for Property in Demolition.—Joseph Lord, builder, was summoned at the Middlesbrough Police-court on the 12th inst. for contravening the Corporation By-laws, by neglecting to properly fence in property in Albert road, one of the main streets of the town, which property was being pulled down. Mr. Lord has the contract to pull down the property, and had notices served on him by the borough surveyor (Mr. E. D. Latham) to fence in the building in accordance with the by-laws. The notices were not obeyed. The surveyor added that defendant ought to have erected a hoarding round the building, with a platform and hand-rail to serve as a footway for passengers outside the hoarding. The Corporation officials, feeling they were entirely ignored, and as a warning to others, instituted legal proceedings. Defendant pleaded against being singled out, contending there were other offenders. The magistrates imposed a fine of £5, including costs.

CHIPS.

Large new ophthalmic schools are being erected at Hanwell, and special attention is being paid to the ventilation, which will be carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

Saturday, the 26th inst., has been appointed for the private view of the autumn exhibition (the nineteenth) of the 19th-Century Art Society at the Conduit-street galleries, and the exhibition will open to the public on Monday, the 28th inst.

At a meeting of the Rochdale Bright Memorial Committee, on Tuesday, it was unanimously resolved to intrust the commission of the late Mr. John Bright's statue to Mr. Hamo Thorneycroft, R.A.

Various alterations and additions have recently been made at the Sun Factory, St. Philip's, Bristol, for the Bristol branch of the Chemists' Aërated and Mineral Waters Association (Limited), of Harrogate, London, and Bristol, by the direction of the manager, Mr. R. R. Groome. The work has been carried out by Mr. A. J. Beaven, of Bristol, from the drawings and specification, and under the superintendence, of Mr. E. Henry Edwards, architect, of that city.

At a meeting of the Walsall Town Council, on Monday, it was decided that Mr. R. H. Middleton, deputy borough surveyor of Birkenhead, be appointed borough surveyor, in the place of Mr. Hardwicke, at a salary of £350 a-year, to be increased to £400 at the end of twelve months' service if the duties have been performed to the satisfaction of the council; and that a gratuity of £50 be paid to Mr. Hardwicke, who is ill, on his retirement.

A conference of bodies interested in the navigation of the river Severn was held at Worcester on Friday to discuss the advisability of improving the navigation, at an estimated cost of £25,000. Resolutions were unanimously passed that the work be carried out, and that the Severn Commissioners apply for the necessary permission from Parliament.

A Liberal club-house is being built in Lea-street, Fartown, near Leeds. It will cost £1,400, and is being erected from designs by Mr. W. Riley, of Huddersfield.

The committee appointed to collect funds for the building of a church to seat 250 at Llandaff Yard have accepted the designs of Messrs. Kempson and Fowler, architects, Llandaff, and have instructed them to carry out the work. A church was much needed in this part, and no doubt the work will be commenced at once.

Our Office Table.

The Museum Committee of the Nottingham town council have just made a report on the desirability of restoring the kitchens on the north front of Nottingham Castle. Although the main fabric has been restored from the effects of the incendiary fire of 1831, and converted into a museum, that portion of the fabric has remained in a ruined condition. The matter has become urgent on account of the difficulty of finding a suitable place for the exhibition of Lord Savile's gift of art treasures from the Temple of Diana at Nemi. The collection is now ready for exhibition, but there is no space available except a packing-room, while storehouses have to be hired in the town for surplus works. The committee now recommend that plans prepared by Mr. Herbert Walker, A.M.Inst.C.E, be adopted for the restoration of the external portions of the kitchens, and some additions to the stability of the building, and a better approach thereto. The estimated outlay is £3,500, and the plans follow the lines of those prepared by Mr. Arthur Brown, the borough engineer, some years since.

The presentation of the testimonial to Sir C. T. Newton at the Asiatic Society's Rooms in Albemarle-street, on Tuesday afternoon, was the occasion of an interesting and well attended gathering of his friends. Earl Carnarvon, who presided, recapitulated Sir Charles Newton's services to the nation since 1840, the date of his appointment to the British Museum, fitting reference being made to his remarkable discoveries of the Mausoleum at Budrum, and his excavations at Cnidus and Branchidæ, to his labours at the Museum, and his professional lectures at University College, London. The chairman unveiled the marble bust of Sir Charles Newton, the work of Sir J. E. Boehm, and intended to be placed in the British Museum, and stated that the surplus of £300 remaining would be devoted to the purposes of the British School of Archæology at Athens. Sir C. Newton suitably responded, expressing regret that life was much too short for the work which had to be done. When he was at the British Museum, he always felt that he should like to have devoted twice as much time to making the great collection of antiquities more known and appreciated by the British public. He had, however, done what he could, but he felt sure that his successor would surpass him in making the great treasures of the Museum available to scholars from all countries who were in the habit of visiting the institution.

Mr. William Forrest, Hon. R.S.A., the well-known engraver, died on Tuesday at his residence, Archibald-place, Edinburgh, at the ripe age of eighty-four years. Born at Burnwynd, Midlothian, in 1805, Mr. Forrest, who was the son of a blacksmith, was apprenticed to the late W. H. Lizars, a famous engraver of his day. By Forrest's engravings a large public became acquainted, by black and white translations, with pictures by many of the old Scottish Academicians who would never have had an opportunity of seeing the originals. The training he received from Lizars made Forrest a worthy member of the school of Scottish steel-plate engravers, and trained him as an artist, not a mere mechanic—a translator of pictures from one medium to another, not a transcriber. He chiefly excelled in landscape, and his sympathies were so broad and his hand so free that he could produce plates of pictures in diverse styles of art. In 1877 the Royal Scottish Academy, on the motion of Sir Daniel Macnee, then president, elected Forrest an hon. academician, "in recognition of his eminent talents as an engraver, and also of his many estimable qualities"; and, in 1884, Forrest presented to the Academy a valuable portfolio containing 161 engravings, being copies of the plates which he had done with his own hand. He is survived by a widow and one son. The funeral takes place to-day (Friday), and will be attended in their official capacity by the members of the Royal Scottish Academy.

Sir Alexander Christian, in the absence of the Lord Provost, presided over a large public meeting held on Monday at the Freemasons' Hall, Edinburgh, for the purpose of promoting the national system of Registration of Plumbers. Among those present were General Sir Murdoch Smith, Director of the Science and Art Museum; Professor Crum-Brown, Principal Grant-Ogilvie, of the Heriot Watt College; Dr. Littlejohn, City Medical Officer of Health; several members of the corporation, medical men, architects, sanitarians, as well as representatives of the plumbing trade (masters and operatives), and the general public. Dr. Littlejohn said he had no hesitation in asserting that the registration system both deserved and enjoyed the support of the public. Professor Crum-Brown spoke strongly in favour of technical education classes. He said they were necessary to the efficient training of plumbers, because they enabled the men to understand the reason for doing the things they were taught to do in the workshops. Principal Grant-Ogilvie endorsed the views of Professor Crum-Brown, and added that it was useless to set up a standard of qualification for plumbers if they did not also give them the means of qualifying themselves. The Clerk of the Plumbers' Company, London, said he was glad to be able to state that organisations for carrying out the national registration system were now widely established throughout the kingdom, and that already about 5,000 plumbers were enrolled on the company's register, while in most of the districts classes were available for the practical and theoretical instruction of plumbers.

On Saturday afternoon a public meeting was held at Galashiels for the purpose of forming a local organisation to carry out the National System of Registration of Plumbers in the locality. Provost Brown occupied the chair, being supported by Dr. Menzies, Galashiels; Mr. Rowand Anderson, LL.D.; Mr. Rennie, Secretary of the District Council for Edinburgh and the East of Scotland; Mr. James Macdonald, Edinburgh; and representatives from Kelso, Hawick, Melrose, Selkirk, &c. The chairman having explained the object of the meeting, and the registration system having been fully discussed, resolutions were put and unanimously carried to the effect that a centre for carrying out the system be formed at Galashiels, and a local committee was appointed, including the following representatives of the public:—Provost Brown, Galashiels; Provost Roberts, Selkirk; Provost Milligan, Hawick; Mr. Allison, architect, Hawick; Dr. Somerville and Dr. Menzies, Galashiels; and an equal number of master and operative plumbers.

MEETINGS FOR THE ENSUING WEEK.

Monday.—Royal Academy Lectures in "Anatomy," No. 5, by J. Marshall, F.R.S. 8 p.m.

Tuesday.—University College, Gower-street. Free Lecture on "Applied Art," No. 2, by H. Stannus. 5 p.m.
Sanitary Institute, "Sanitary Appliances," by Prof. W. H. Corfield. 8 p.m.

Friday.—Royal Academy Lectures, "Anatomy," No. 6, by J. Marshall, F.R.S. 8 p.m.
Sanitary Institute, "Scavenging, Disposal of Refuse and Sewage," by H. Percy Boulnois, M.Inst.C.E. 8 p.m.

National Registration of Plumbers.—Plumbers Registered Since Last List.

London Master.

Franklin, F., 71, Cheyne-walk, Chelsea, S.W.

London Journeymen.

Clement, C., 20, Ross-villas, Mortlake-road, New Richmond, S.W.
Wolfenden, R., 11, Tyas-road, Hermit-road, Canning Town, E.

Provincial Masters.

Bevan, J. A., 3, Dillwyn-street, Swansea.
Harbour, L., Fore-street, Chard, Somerset.
Mosdell, C., Mortimer, Berkshire.

Provincial Journeymen.

Carson, S. J., 11, Bristol-street, Belfast.
Charles, S., 39, Hartnup-street, Liverpool.
Edgar, N., Albert-terrace, Coleraine.
Houston, G., Bell House-lane, Coleraine.
Johnston, C., 3, New Dock-street, Belfast.
Lindsay, T., 106, Percy-street, Belfast.
Lowry, A. A., 4, Greenmount-street, Belfast.
Manderson, J., 42, Upper Canning-street, Belfast.
Martin, J., 30, Swift-street, Belfast.
McClure, J., 27, Little May-street, Belfast.
Pottage, E. R., 7, Othello-street, Stanley-road, Liverpool.
Taggart, J., 53, Glengall-street, Belfast.
Worrall, J., 6, Horsley-street, Liverpool.

The new postal sorting office recently erected at Acton has been ventilated on Kershaw's system, the patent inlet and air diffuser being adopted for the supply of fresh air and the patent pneumatic ventilator for the removal of vitiated air.

Holloway's Pills are the most efficient restoratives when the spirits droop and the frame feels languid. They preside so effectually over the digestive organs, and regulate so nicely the secretive and excretive functions, that they generate elasticity of mind, with strength and health of body, and improve the constitutional vigour.

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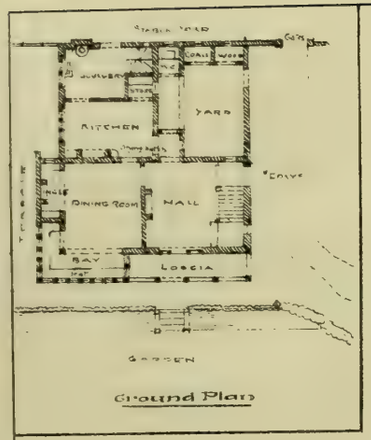
TENDERS.

. Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

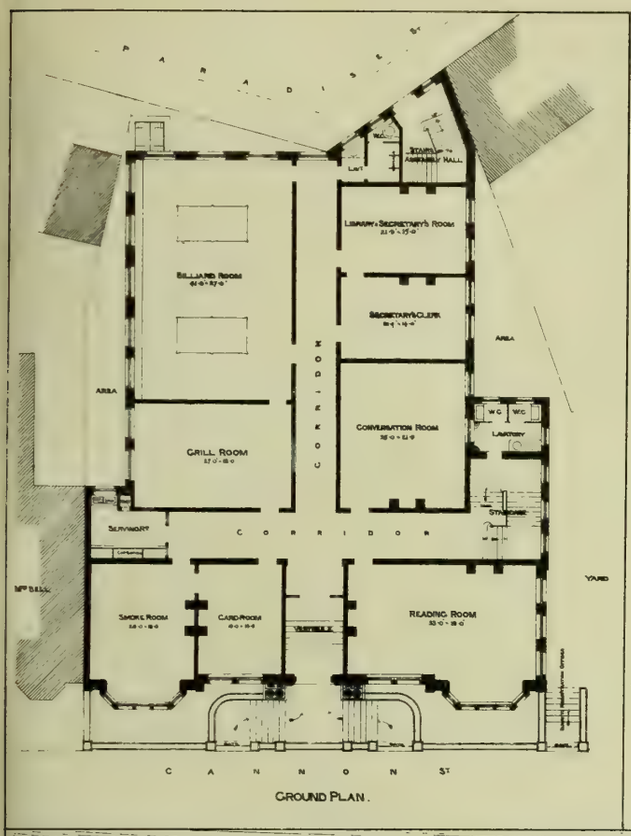
Aberdeen.—For the building of a new prison at Craiginche, for H.M. Prison Commissioners: —Macandrew and Co., Aberdeen (accepted) about £30,000.

Aston, Birmingham.—For the erection of a boys' department at Aston-lane board school: —
Hughes, R. M. (accepted)... ... £2,521 0 0
For the construction of a swimming-bath at the school —
Hughes, R. M. (accepted)... ... 550 0 0

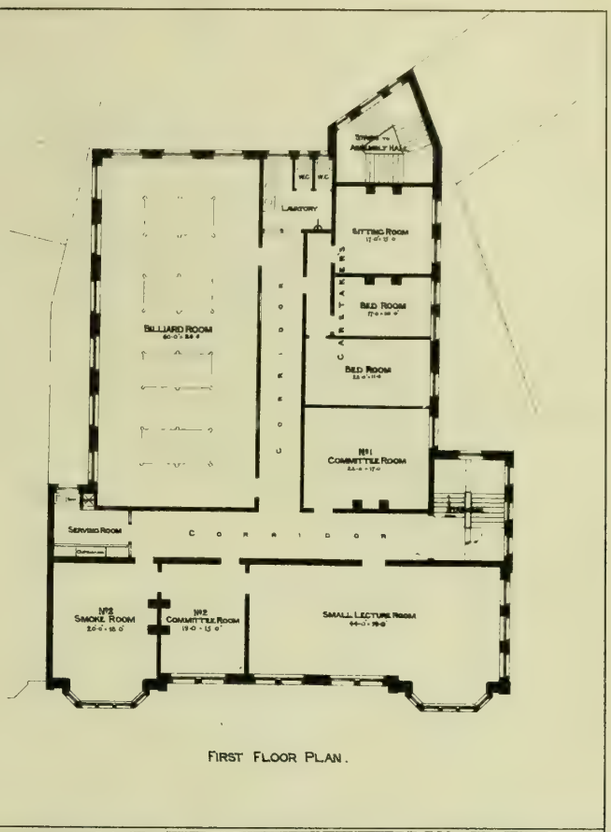
Cottage at Wroxham, Norfolk.
for T. Gordon Brown, Esq^re.
Lawrence Youngs, Arch^t.



Ground Plan



GROUND PLAN.

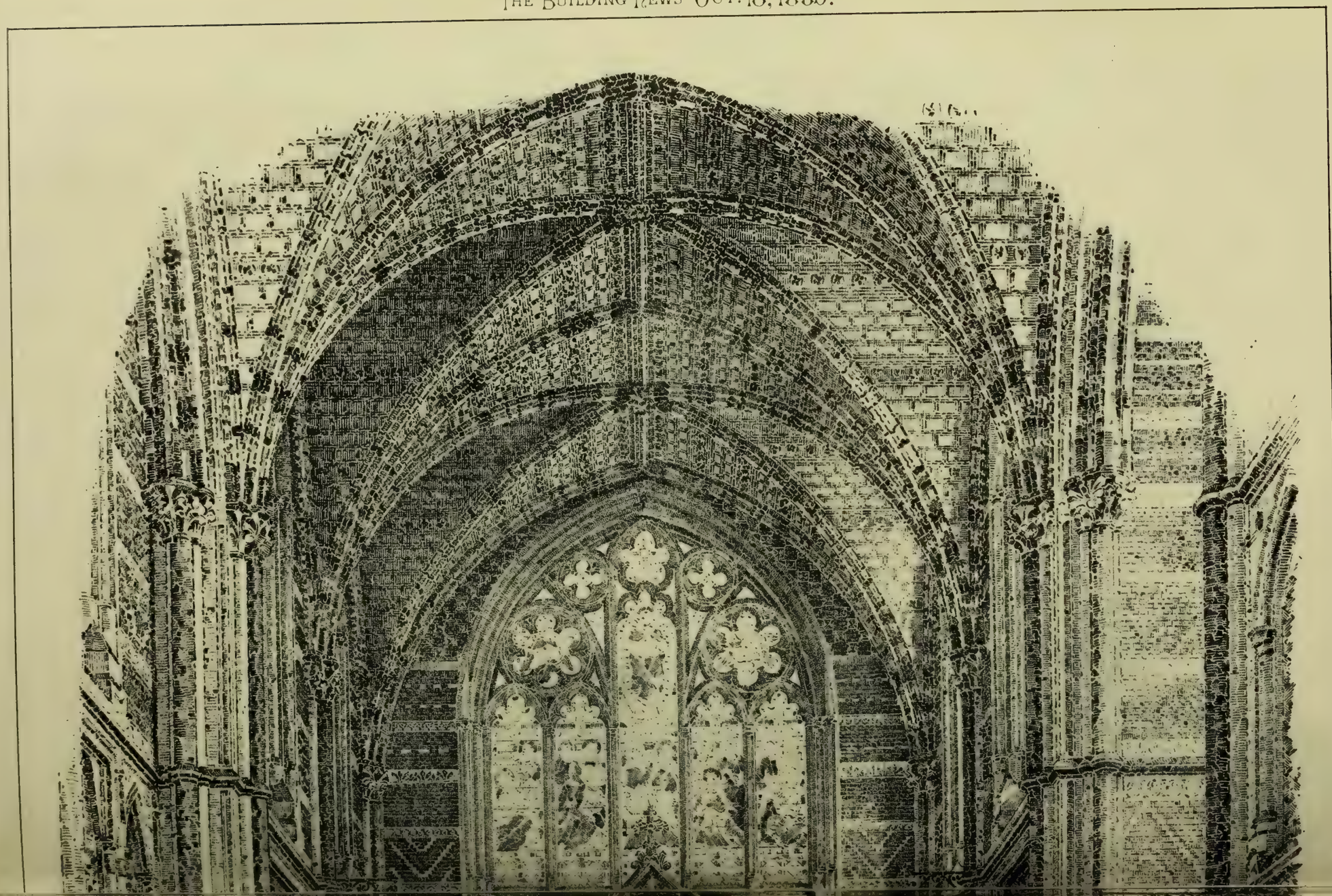


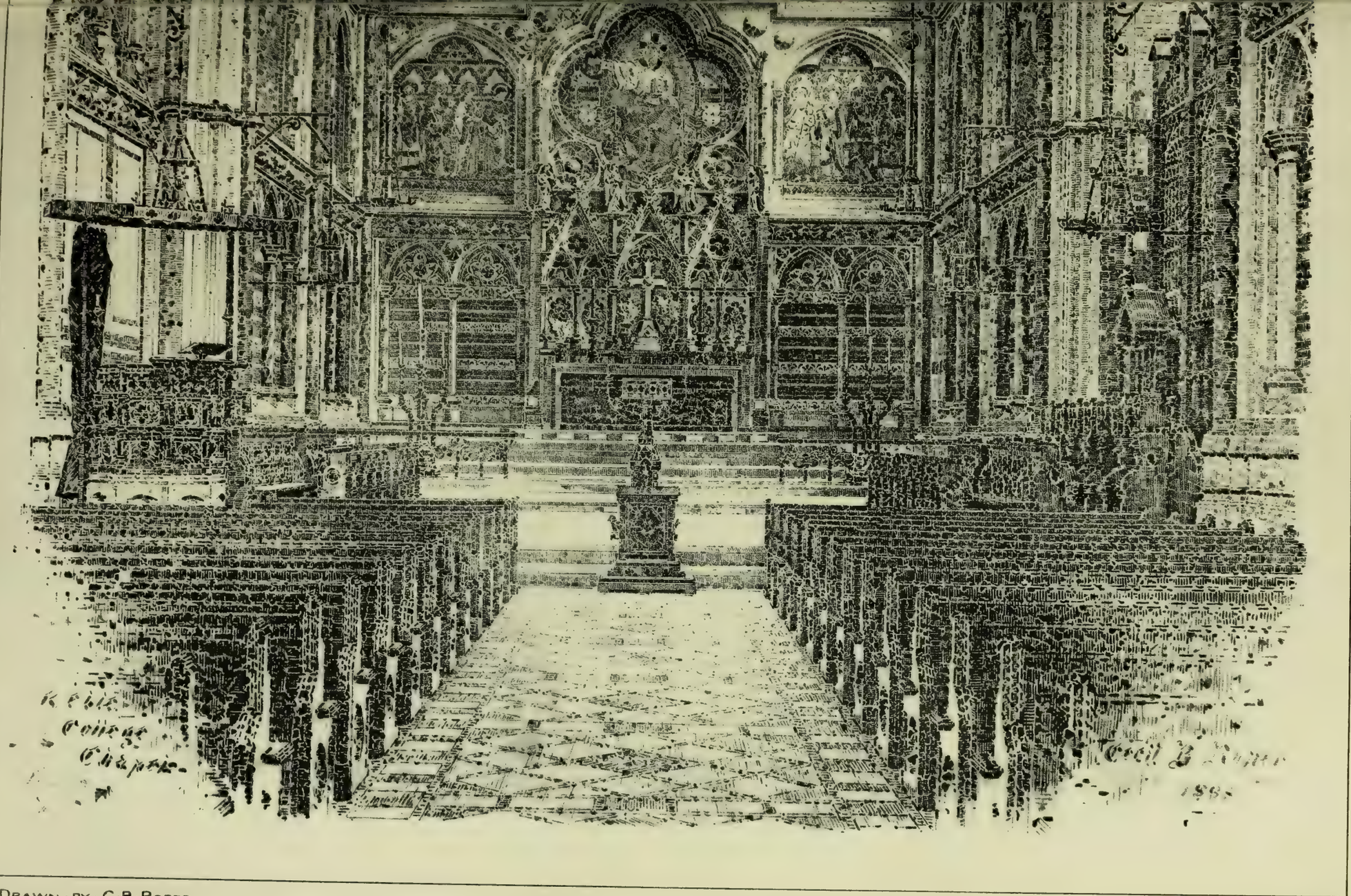
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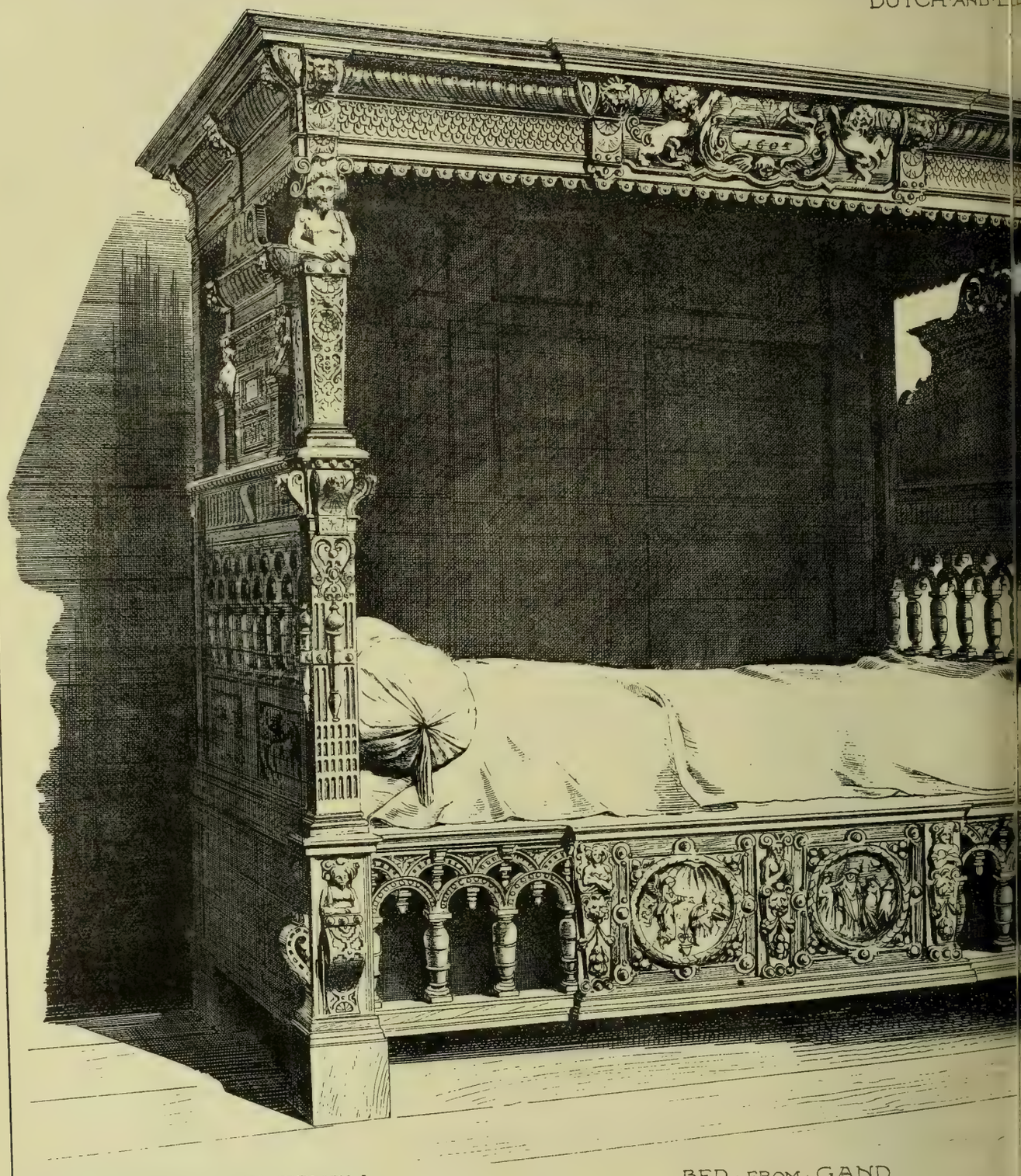




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BED FROM GAND

CORBELS FROM ZUTPHEN



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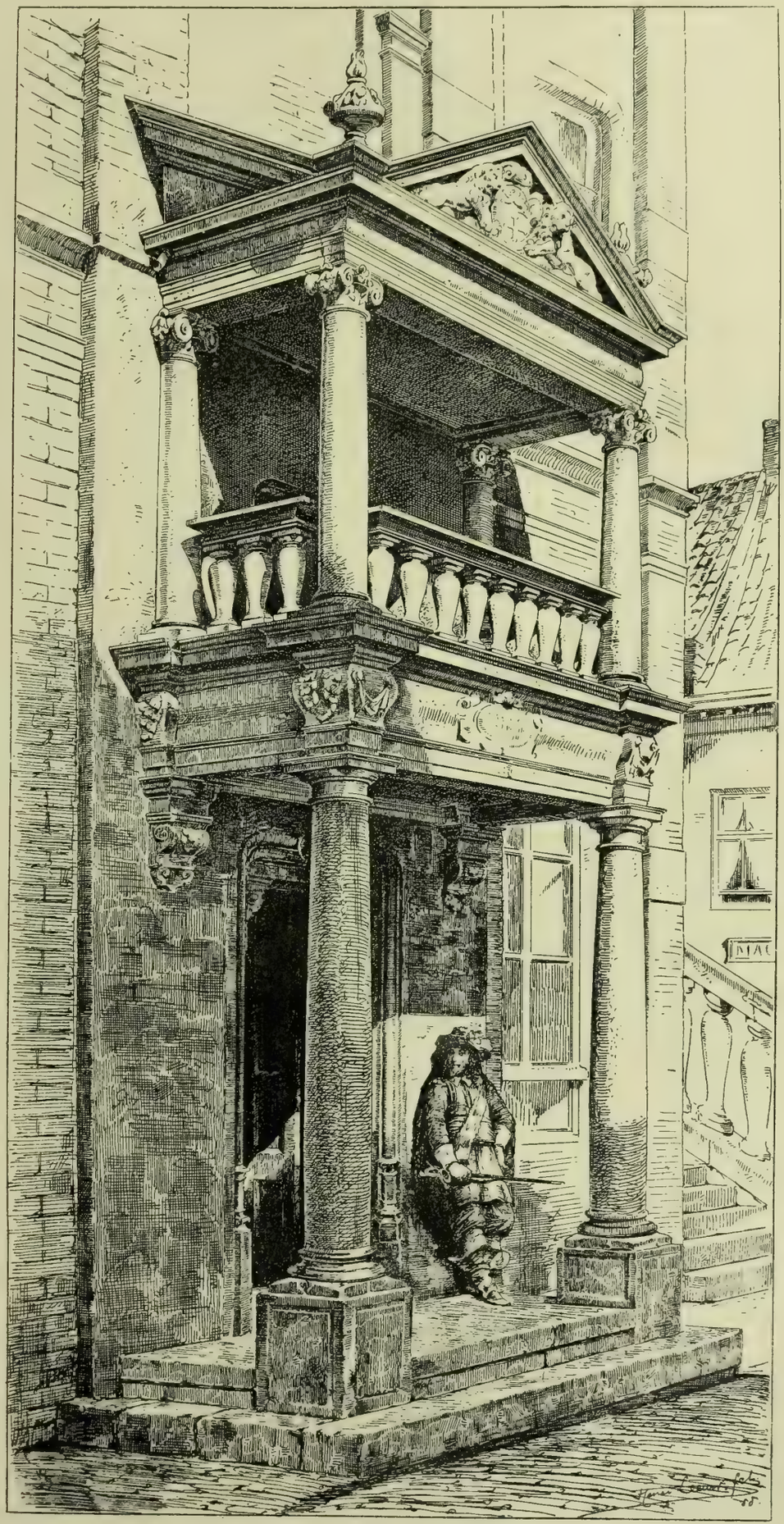


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GLAN RENAISSANCE." DRAWN BY HENRI LEEUW AND EMIL MOURIS ARCHTS





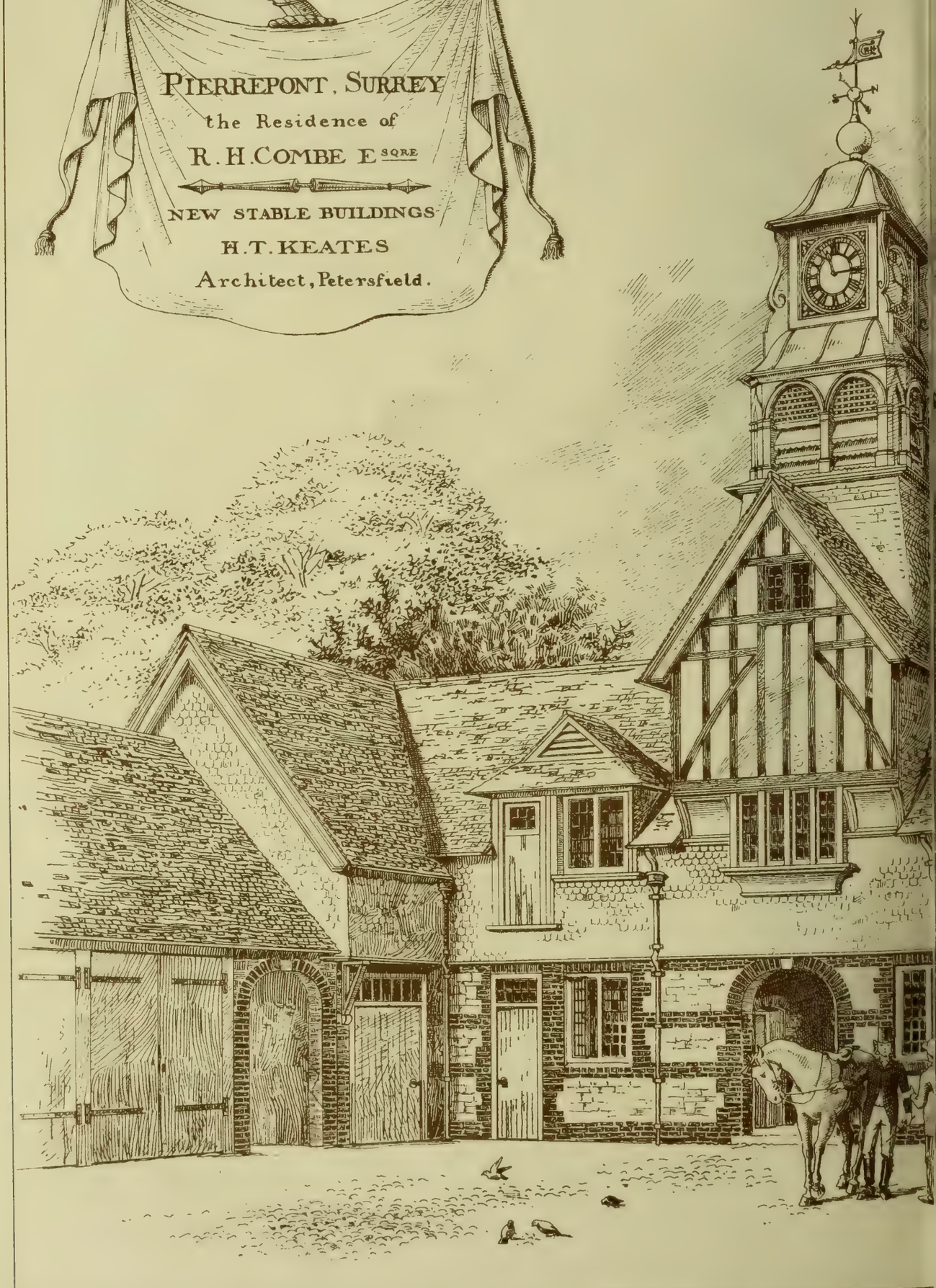


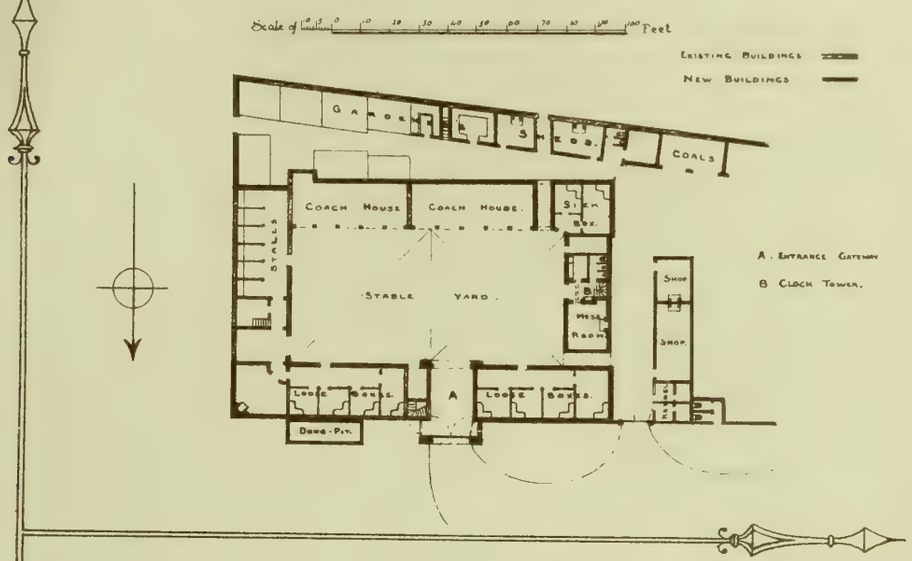
PORCH AT ZUTPHEN

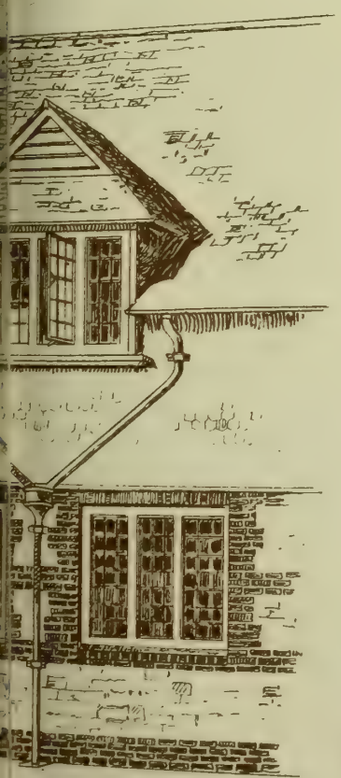
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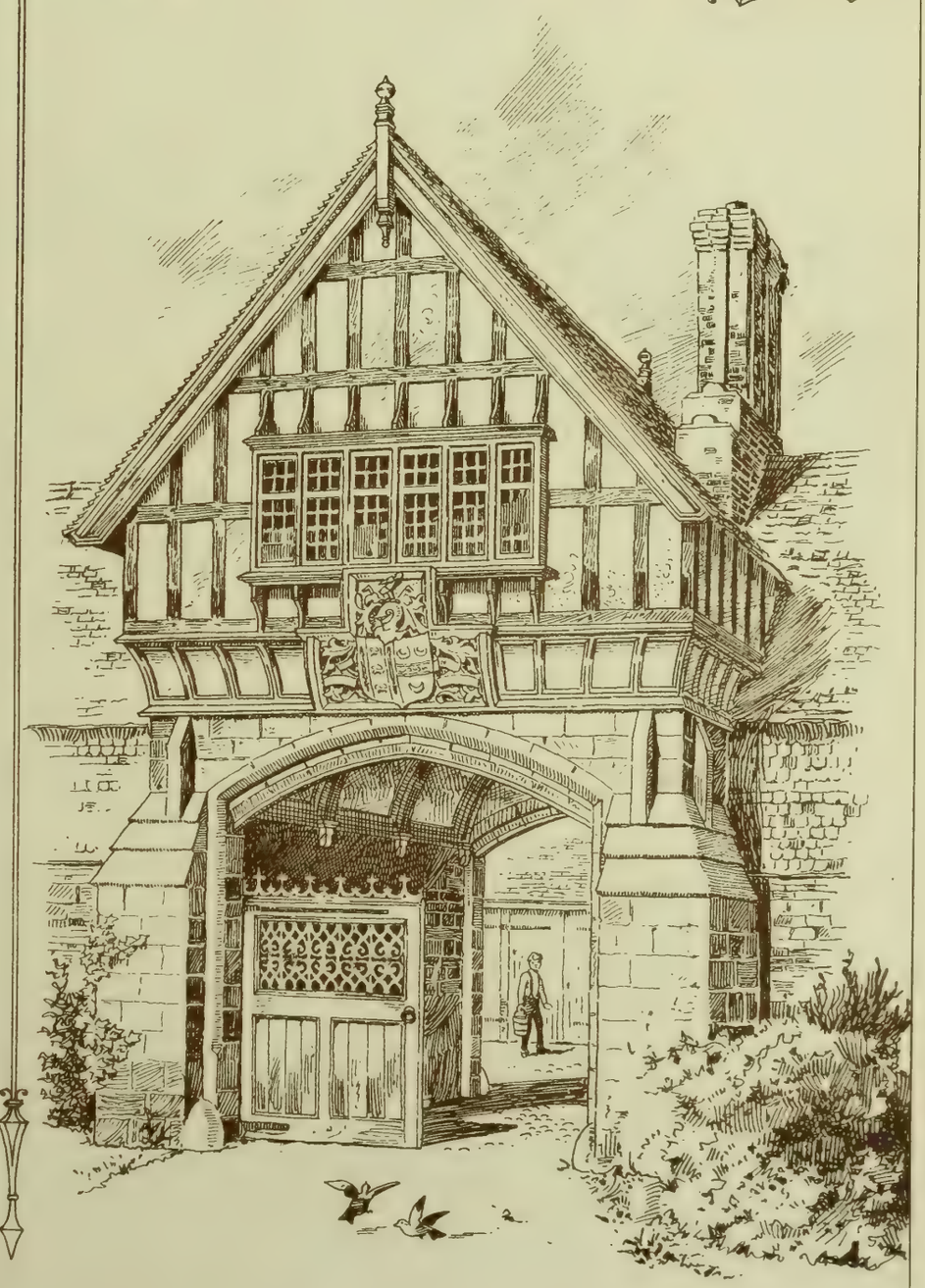


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FRIDAY, OCTOBER 25, 1889.

PROFESSIONAL PRACTICE AND CONDITIONS FOR CONTRACT WORK.

THE lecture session is about to be resumed, and soon we shall find the architectural societies in full swing. The topics that will be debated will presumably be those affecting the status of the profession, the progress of architectural education, examinations, registration of architects, federation—questions of ever recurring-interest to members of societies, but which do not appear to trouble these practitioners who have plenty to do, and are willing to let well alone. It is extraordinary how little the clatter of societies affects the rank and file of the profession outside their influence; how much stronger would be the societies if they could enlist more interest outside the four walls of their chambers. We cannot mistake the fact that membership is not a thing coveted by those who are in a successful way of business, that few of our eminent architects or engineers think that any distinction is conferred upon them by belonging to this association or that society. Those who take part in meetings are the younger and more active spirits of the profession, who join because they desire the co-operation of their fellows, and because membership confers advantages upon them, and insures a coherency which is necessary and desirable. Architects have certainly not the will or power of combining, as one correspondent has pointed out in a letter on Restoration, and for this reason they are powerless to make their opinions heard.

There are many professional questions which at the present time are only waiting for a general unanimity to make them recognised. The majority of architects will work in ruts. What they have learned while serving their pupilage, or have seen done in certain offices, they accept without further inquiry. They like it because it is the routine in which they have been brought up. The routine may be good to a certain point; but when something comes along to upset it, the young practitioner is entirely adrift, and does not know where to turn for advice. Often it is a question of contract. A form has been used that has up till now answered its purpose. This time a question has arisen respecting the effect of a certificate in a case of extras. The contract states extras done without a written order cannot be claimed; but the architect gives a final certificate for work which includes a certain amount of extras. The contractor pleads this circumstance, and places the architect in an awkward position, as by the ruling of one case the architect's certificate is conclusive and final, and the contractor can claim the extras, notwithstanding there are no written orders to show for them. Had the contract been worded to meet such a case by saying that a final certificate must be taken without prejudice to the liability of the contractors, possibly the consequences would not be so disastrous; the architect at least would be strengthening his own hands and protecting his employer if it were made necessary in the contract in every case to produce written orders signed by him, and also for the production of vouchers for day work that may be directed.

At another time the arbitration clause may be too vague to be of any value, or perhaps there is no provision at all that will meet a case in which the architect quarrels with the builder about some discrepancy between the contract plans and specification, or about any right of the contractor to charge for work which he calls an extra, but which is disputed by the architect. These are questions of contract which routine precedents do not anticipate, but which ought to be decided by architects in congress. There would be fewer disappointing legal decisions if the profession were agreed as to a mode of arrangement or arbitration in case of any of these questions arising. What architects require is a court of appeal, composed of members of their own body, who would decide points of disagreement upon some recognised principles of equity, and it is for the professional societies to take up these questions and formulate certain rules that would have the concurrence of builders. We suggest that the following are questions that ought to be authoritatively decided in this manner: 1st, The bases of competition for designs and for tenders; the code of rules prepared by the Competitions Committee of the Institute, and for the direction of architects competing, would be a good foundation to work upon to draft a report that ought to find acceptance by all professional men of any standing and respectability. The points upon which the profession ought to be heard through their societies, are the terms upon which they will compete. These would include the number and description of drawings of a building, the scale; whether drawings are to be coloured, and if so in what way, and the colours to be used; if perspectives are to be prepared, if so, how many; the points of view; the cost of the proposed work; instructions to the architects as regards accommodation, stating exactly what requirements are indispensable, and which are left to the competitors judgment; the style, if any; the mode of selection, the appointment of assessor, the premiums and mode of payment, and other points which experience has proved to be necessary to prevent after-disagreement, and to obtain the best results. Once a code has been accepted by the majority of the profession, it should be strictly enforced on promoters of competitions, and if architects agreed loyally to be bound to the terms, dishonest competitions would soon become a thing of the past. With regard to builders' competitions, or the conditions of tendering and estimating work, equally stringent conditions are required in the interests of good building and honourable conduct. It is because there are no such rules that advantage is taken by dishonest tradesmen. In this question the profession and the building fraternity might take a lesson profitably from the report recently read at the late Convention of the National Association of Builders of the United States. A legislative committee was appointed by the association to get evidence and report on the conditions for estimating work. A code was prepared at the previous convention; but the rules therein formulated had not been endorsed by builders and architects jointly. The amended code is based on the reasonable assumption that those matters which concern builders ought to be distinctly recognised; that one portion of the code ought to lay down the conditions and methods that concern architects, and the other to comprehend those which apply to the relation of builders towards each other in matters connected with estimating. The code thus framed is divided into two parts, the first setting out the just and proper methods which architects should use who wish to obtain estimates. The report, which was carried, recommends all affiliated bodies of builders to secure the co-operation of architects in their various localities, through organised bodies when possible, in the code, in order that there may be a well-defined and recognised practice under which estimating should proceed. Briefly, Code I. prescribes—(1) that plans, when offered for competitive estimates, should be sufficient in number and character to represent the work clearly, and to be of a scale of not less than $\frac{1}{8}$in. to the foot, and be in ink; (2) that the details should be furnished for work that is not otherwise sufficiently described; (3) that the specifications should be in ink, and be definite where not defined or explained by drawings; (4) that contractors should be informed at the time if they are to be restricted in the employment of sub-contractors; (5) sub-estimates for portions of work which bidders are required to include in their original estimates should not be received in architects' offices; (6) contractors to be allowed a compensation of 10 per cent. on all sub-contracts which at the time of estimates are reserved or not called for in their portion of the specification, but which may be assumed by them by direction of owner or architect; (7) a sub-contractor should not without his consent be placed under a general contractor; (8) estimates should not be binding more that 30 days after received; (9) unless previous notification to the contrary, the lowest invited bidder should be entitled to the contract; (10) should all bids be refused, the lowest bidder should be entitled to compensation (a schedule being appended). Code 2 is to be observed by all contractors: (1) a principal contractor having been awarded a contract involving sub-contracts, his estimate being based upon sub-estimates which he has solicited, should award the sub-contracts to the lowest bidders, and should notify to the sub-bidders the result as soon as the contract has been awarded to him; (2) principal contractor not to be considered under obligation to use a sub-estimate that is unsolicited, even if it be the lowest; but he must not reveal the bid, or use it in any way to influence any other party; (3) sub-contractors should avoid leaving their estimates in architects' offices when they are received there simply as an accommodation to and for the information of principal contractors, as by such action bids may become known to competing sub-contractors before estimates are closed; (4) any member detected trading on any of the sub-bids, whether solicited or not, should be liable to forfeiture of membership, censure, or suspension. These codes were carried, and the clauses, especially 4, 5, 6, 7, and 8 of the first, and all those on the second, are worthy of the attentive consideration of builders and architects. We might profitably dwell on the importance of the conditions and restrictions as to sub-contracts in both codes if space permitted. Co-operation between architects and builders is, of course, the only mode by which such rules can be effectually enforced. The form of tendering ought to be defined, as we have lately hinted, and reference be made to the form of contract. Architects and builders ought to agree to conditions as to the insertion of provisional sums, especially the percentage the contractor should be allowed to charge upon them. Again, as to specialities to be introduced, it is desirable that architects should have the power to introduce any special fitting or material in ordinary contracts. Tests of materials such as cement and iron or stone ought to form one of the conditions in a code between builders and architects. Modes of measuring works, material, and labour are important matters upon which each locality might profitably appoint a committee to report, so that a recognised body of rules could be framed. The charges made by architects for special services, such as decoration, fittings, and other special kinds of work, equally call for the unanimous decision of the profession. If a representative body of the profession appointed a committee to obtain the views of architects in every locality and report upon these questions of practice, a schedule could be framed that would be of some value, even although rigid compliance could not in every instance be expected. The questions we have referred to are all pressing, and the sooner they are settled, the better it will be for everyone concerned.

WARMING BUILDINGS.

THE means of warming buildings are generally confided to an engineer whose experience in arranging and fitting up apparatus entitles him to the consideration of the architect. Yet how very few buildings are there which show much skill in the economical distribution of the heat. Too often it is an afterthought; the architect has planned his structure without considering the requirements of heating, no provision is made for the apparatus in the basement, the hall is left exposed to a variety of currents of cold air, and draughts are created by the ill-advised arrangement of doors and windows. If the plan could have been submitted to the engineer for his suggestions during its preparation, or if the architect had consulted with him, a scheme of heating and ventilating might have been prepared for; but this is not the course usually adopted by architects. The consequence is the engineer's arrangements are made to suit the building when finished. Many of our public buildings are warmed by imperfect arrangements which have been made after the structure has been completed. These arrangements are generally costly, and have to be supplemented, owing to imperfect ventilating arrangements, which ought to be devised in connection with a warming scheme. We may generally assume that all buildings are warmed by radiation or conduction. Under the first head, the open fire by grates of various kinds is the commonest form employed, and for dwelling-houses this primitive principle will probably outlast the more scientific systems of warming. The other kind of heating by conduction is effected by close fires in furnaces, by gas apparatuses with heating flues, the principle being that the metal plates are heated by the combustion, and by the aid of flues a large heated surface is obtained. Haden's system of heating has been adopted largely for churches, for which purpose it answers well. Amongst the stoves used we may mention the "cockle" convoluted stove such as Constantine's, the "gill" stove, the Gurney stove—a kind of "gill"—all very powerful air warmers, which can be placed in churches, schools, and halls. Then there are a variety of gas-stoves; but these have the undesirable result of rendering the air injurious. The same may be said of the hot-air system of heating, largely used in America, the small air-chambers and pipes discharge a over-heated dry air into the room, which is injurious to the throat, and gives headaches to those who have to breathe it for any length of time.

We speak here rather of the heating arrangements of our large buildings. The old "cockle" is still found sometimes sunk into the floor, the smoke-flues being conveyed through the building; but without adding much to the comfort or cleanliness of the place. The upper part of the building is badly warmed, and cold air currents descend upon the heads of those who are seated in buildings thus warmed. A better plan is to provide a space under the floor, supplied with fresh air admitted through gratings let into the plinth, and to place an air-warmer, say a convoluted stove, in the receptacle so formed, with warm-air flues radiating therefrom to grated openings in the floor. This system is derived from the old Roman hypocaust. A more perfect system of warming is that which makes the heat of the furnace assist in extracting the air of the building. This principle is employed in Messrs. Haden's plan. The foul air is made to supply the furnace when once it is lighted, and fresh air is admitted through the ordinary apertures. But the question is how best to carry out these arrangements. In the case of a church, theatre, or lecture room the warm-air flues require to be distributed at points which will afford the most desirable or equable diffusion of warmth. This cannot be done by placing the warm-air outlets at one end, leaving the other to the cold draughts from doors and vestibules, though we often see the heating confined to one portion, the bulk of the audience sitting next cold walls or windows. One of the mistakes made in heating buildings by hot air is to have the furnace too small: in cold weather the temperature is raised, and the furnace is liable to expansion and contraction, the air is delivered at a high temperature, and hurtful gases are given off. The air supply is often from impure sources or deficient, often taken from a cellar or basement in which drains are laid or traps are placed. The underground air ducts should be perfectly lined with impervious pipes. The avoidance of horizontal flues is essential if the most economical results are to be expected, though horizontal flues are generally found.

In planning basements for furnaces, the architect seldom takes into account the position most favourable: it is generally assigned to some out-of-the-way corner. If a central position cannot be secured, it is better to place the furnace on that side which is most exposed to the wind, so that the air which passes through the walls may assist the action of the flues. Two or more furnaces are recommended by some authorities for large buildings, for the better distribution of the heat flues. Hot-water heating has its advantages, as the circulation continues for some time after the fire is put out; it is regular in action, and gives an equable temperature. But in arrangements for this system, much is also left to chance. The size of the radiators or coils, and their positions, ought to be determined before the size of pipes can be settled. The failure of hot-water apparatus generally arises from the inattention to these details, and the amount of heat required after abstraction by windows, walls, and ventilation. Often as much heat is extracted by these means as the apparatus supplies to the particular room. The heat is lost by radiation, conduction, and convection. Draughty corridors and rooms, numerous windows, cold floors, and roofs abstract a large percentage of the heat, and this loss must be carefully estimated, before it is possible to find out what amount of radiator surface is necessary to warm the air to a certain temperature. The rules followed are often misleading, owing to the factors used being uncertain and the velocities of air currents being neglected. One American writer says that roughly for hot water a building will require a ratio of plate or pipe surface of from ·70 to ·85 to 1 of glass at the temperature of 140° Fahr. outside, to maintain it at 70° by direct radiation, when the outside air is of the temperature of 30° Fahr. Mr. Hood calculates that each square foot of window-glass will cool in a minute 1·279 cubic feet of air as many degrees as the inside air is warmer than the outside in a comparatively still atmosphere; but the cooling action of glass so much depends on the velocity of the external air, that this proportional rule would not always be correct. Experiments on heating surfaces have been given in books; but accurate data on the cooling action of windows under certain conditions have yet to be made, before reliable rules can be found to give the required radiator surface for any building. These are matters for scientific experiment. We must not forget also, that steam-heating requires more constant attention than the hot-water: the radiating surfaces cool rapidly when the steam in the boiler is reduced; the supply of heat must be regulated and under control, and there is some danger owing to the use of boilers and the proximity of steam-pipes to wooden fixtures, though these dangers can be now reduced to a minimum by careful arrangements. The architect's attention should be given to the position of the radiators, which may be well fixed below the window openings or against the outer walls, so that the warm air may be diffused over the room; and he must so place the air-ducts and flues that the air supply can be thoroughly under control, and be made by passing in contact with the radiators, or independently of them, to give the desired results.

ARCHITECTURAL BRICKWORK.—XXI.

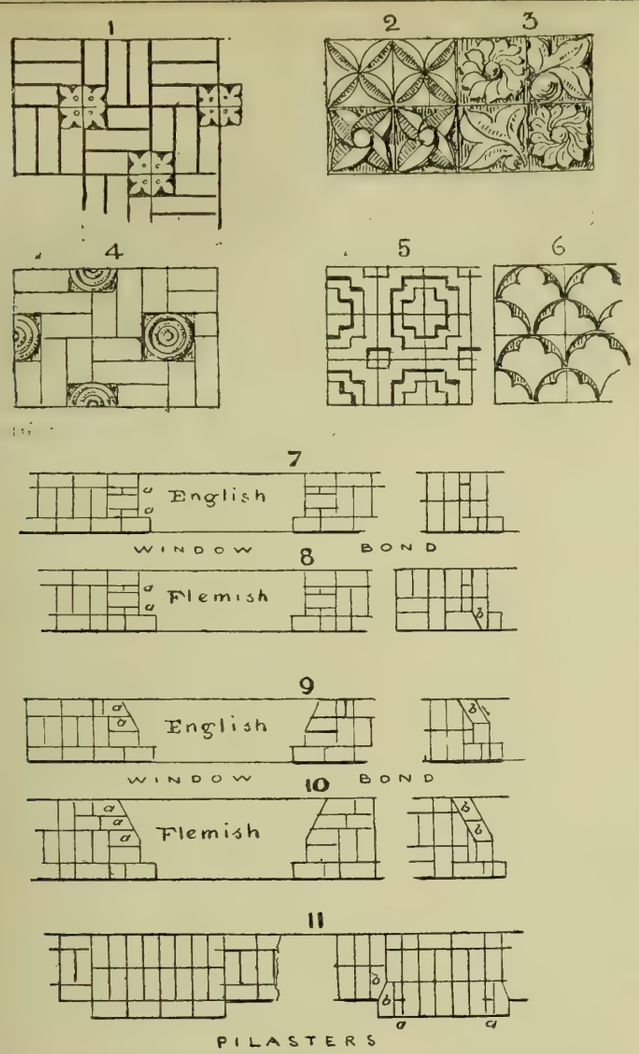
SURFACE ORNAMENT.

THE idea of bond ought always to be present in the mind of the designer of brick ornament. The panels or tiles should of course agree with the courses, and the smaller the panels are, the better the stability of the work. Large panels of several courses in height, fixed against a wall of ordinary brickwork, are, like courses of stone ashlar upon a brick backing, liable to bulge or crack by any shrinkage of the mortar joints or weight. Fig. 1 represents a 6in. panel or brick pattern which quite carries out the idea of bond, and is effective. Figs. 2 and 3 are also 6in. square, and are largely used for diapers in gables; the designs are simple and characteristic. Geometrical patterns adapt themselves well for ornamental brick facings, and Figs 5 and 6, taken from a manufacturer's book, are shown as indicating the sort of ornament suitable for situations which allow of relief. We have seen very effective gable fronts having plain panels or geometrical diapers of 6in. squares, such as 2 or 5, filling the spandrel spaces over a gable window, stopped by a horizontal band a few courses from the gable apex, composed of one course of alternate squares of flower and leaf, or patera and leaf as in Fig. 3.

WINDOW BOND.

We pass on to notice the manner window reveals are formed, and before we describe the more ornamental varieties of apertures in brickwork, it is necessary that the student should make himself familiar with the common modes of bonding used for ordinary square windows. We will first show how the ordinary square jambs and reveals of a door or window are finished. Take a two-brick wall built according to common English bond. Fig. 7 represents two successive courses of a square jambed opening in such a wall. Four closers are used in each jamb behind the reveal *a*, *a*. In Plan 8 we show the two successive courses when the wall is built in Flemish bond. Often a half-closer and bat are introduced in the heading course, as shown in Plan 7. Here we have shown two bricks cut to a bevel or mitre; the former do not make good bond. In Fig. the bevelled brick or "king-closer" *b* used in the reveal to obviate a half-close and bat, and adjoining it on the front is stretcher cut similarly at one end, bot making a mitre. The same plan would better employed in the case of English bon (see Fig. 7), king-closers being introduced the reveal.

We may next take the brickwork windows having splayed jambs with revea as in Plan 9, which shows two successi courses of a two-brick wall worked English bond. It will be seen that t stretching course of the face of wall becon the heading course of the jambs. Here t bricks of the splayed jamb *a* and *a* are cut a splay. The next course shows a ha closer and bat in the front and reveal, a the splay is formed by a brick cut obliquely at each end. There is weakness in the b in front, which might be obviated by king-closer arrangement, shown in Plan forming the face and reveal bricks by a mi and doing away with the half-closer on f In Plan 10, a window with splayed jambs



, wall of two bricks and a half, in single Flemish bond, is shown. In the first course hree splayed bricks are used to form the nner splay on each side, *a*, *a*, *a*. The next ourse shows stretchers in the splays, the ends of the bricks being cut to an angle, *b*, *b*. In he face of work a half-closer is shown, with a three-quarter-brick reveal. The bevelled cing-closer may with advantage be used here also, instead of the half-closer. The splayed ambs are weaker than those built square, and the splay ought not to exceed the proportion of one-half; on the other hand, they are better for the admission of light. Where strength is essential, the splayed opening s undesirable, especially when the piers are narrow. The central part of the pier not affected by the splays can be worked in the regular bond; and some proportion should be observed between this portion and the splayed ends of pier, which are necessarily weaker, being composed of bricks cut to the splay and smaller pieces of brick to fill in the interstices, as shown in Plan 10. It is desirable, therefore, that the splayed ends of a pier between two windows should be laid in heading and stretching courses alternately, avoiding closers. The splayed headers should be cut so that one side of the brick should preserve its entire length, and the angle on the other side cut off; and in the case of splayed stretchers the splays are formed at each end by cutting off the alternate opposite angles, thus reducing the brick to about two-thirds in length. The object should be to make the successive courses of these splayed bricks break joint. Every bricklayer uses his own judgment in forming splayed windows, though we have seen very weak and clumsy arrangements in which closers are largely employed.

PILASTERS.

A great deal of architectural effect is produced by pilasters or projecting piers, and these are usefully introduced at the angles of building as well as at intervals along a front. We find all sorts of bond introduced in the piers between windows of ordinary houses. Regular Flemish bond, which is generally employed, can only be obtained by proportioning the pier or pilaster to a certain number of bricks and half-bricks, or stretchers, as $2\frac{1}{2}$, 4, $5\frac{1}{2}$, or any number of bricks, increasing by one-and-a-half brick. If English bond is used, any number of whole bricks can be made to produce a regular appearance. If the pilaster in width contains a half-brick, a bat has to be introduced in every stretching course; so with pilasters having a quarter-brick in its width there will be a closer in every course, but at alternate ends in both these kinds of bond. Thus it will be observed that in planning pilasters or piers the architect should decide upon their width by making them a certain number of bricks and half-bricks wide, if regularity of bond is to be produced; otherwise we may see two stretchers or two or more headers together in the same course. We shall show a few instances of this irregularity in our next.

Plan 11 represents the plan of two successive courses of a pilaster built in English bond two and a half bricks in thickness. In the header course it will be seen that the corner headers of pilaster and the header at the re-entering angle are bevelled or mitred, king-closers being used, *b*, *b*. Closers *a*, *a* are also used in the face next the king-closers. By this plan of forming the angles the joints are broken, the stretcher at the salient angle overlying the closer, and the header at the re-entering angle in the substance of the wall covering the splayed joint of the two king-closers.

ARCHITECTURAL ASSOCIATION.

THE annual general meeting of the Association was held on Friday evening, the President, Mr. Leonard Stokes, in the chair. The adoption of the annual report was moved by Mr. Cole A. Adams, past president, seconded by Mr. R. M. Roe, and carried, and the balance-sheet was also adopted on the motion of Messrs. Hampden, W. Pratt, and Bulmer Booth, the auditors, Messrs. Reginald A. Rix and Max Clarke, being thanked for their services. The President proposed that a hearty vote of thanks be accorded to Mr. J. Douglass Mathews, who for five-and-twenty years had been an officer of the Association. During the latter and greater portion of that long period Mr. Mathews had been their treasurer, but now felt compelled by business duties to resign that office. The vote was passed by acclamation, as was also a similar complimentary acknowledgment of services rendered by Messrs. W. Burrell, H. O. Cresswell, T. A. Pryce, and Earle, and the other members of the committee who helped to make the *conversazione* a success. The presentation of the prizes was then made by the President, in accordance with the list published in our issue of the 11th inst., p. 485, the President drawing attention to the fact that, contrary to the custom of some previous sessions, the actual medals and volumes awarded to the competitors were formally handed over.

THE INAUGURAL ADDRESS

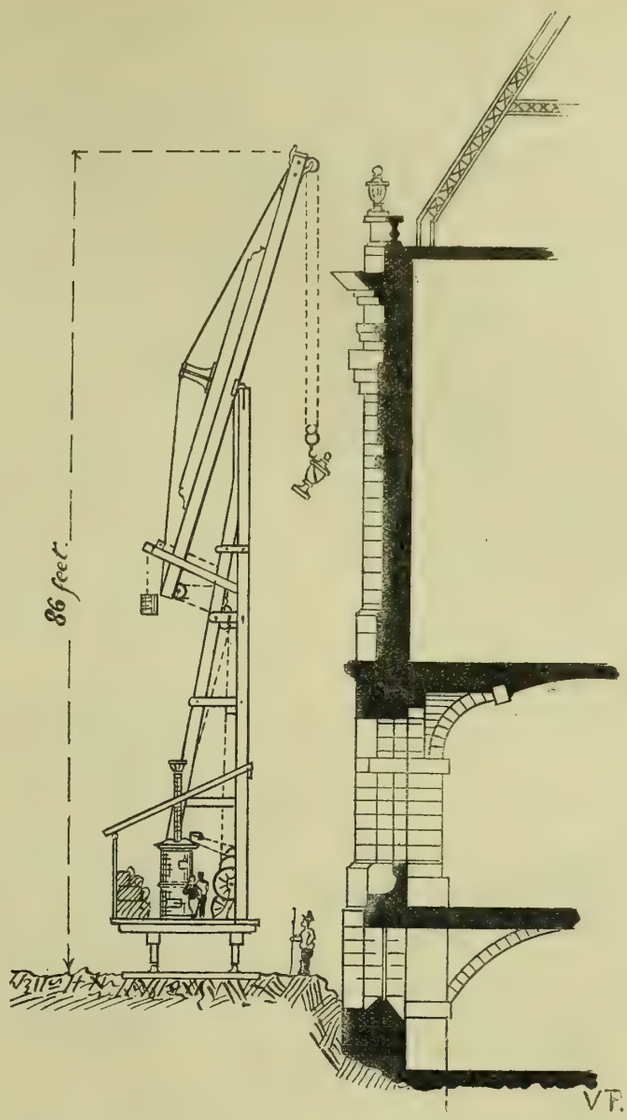
was then read by the President. In his opening remarks, he laid stress on the importance of organising and directing a well-devised scheme for the education of youths entering the profession. The present system of placing a young man in an architect's office as a pupil to "pick up" what information he could was an excellent one in theory, but in practice not quite so good. The Architectural Association was established to help the student, both in his pupilage and in his subsequent stage of "assistant," to acquire a little more knowledge than was generally to be learned in an average office. It was now, however, beginning to be felt that "the picking-up system" was far from satisfactory, and it was necessary to acquire considerably more knowledge than could be "picked up" in an ordinary office. The Association undoubtedly helped considerably, but did not go so far towards fulfilling this very desirable object as he should like to see. He therefore proposed to endeavour, as far as he was able, to point out wherein they might improve themselves, and by what means they could best improve those of their neighbours who were open to improvement, this latter being one of the main reasons for the existence of the Architectural Association. Although their methods might be open to criticism, yet what other profession was there which had in its midst a body of men, giving to the best of its ability, and on voluntary principles, the education of the profession to which its members belonged? But, perhaps, this very fact that no other profession worked on their lines tended to show that they might not be working in the very best possible way. As during the present session they must content themselves with things as they existed, since any reform or change needed time for development and trial, he advised all to work as much as possible and grumble as little as they could during the session. Among the most useful classes were those for the study of colour and of quantity and land surveying, and members would benefit themselves by supporting these heartily. Few seemed to realise the amount of work that fell upon the shoulders of the honorary secretaries, and he asked them, therefore, not to pester those officers with too many letters asking questions, the answers to which could be found in the "Brown Book." The secretaries had their own work to attend to, but members did not always appear to remember that fact. Most members were aware that a special committee had been recently appointed to consider and report upon the whole working of the Association, with a view to pointing out in what direction or manner it could be improved and developed. There was not much doubt that the Association was open to considerable improvement; otherwise, how was it that, when a member wished

to go up for the Institute Examination—for which their course was intended to be a direct preparation—instead of availing himself of the opportunities offered in the Association, he went to a private institution to obtain the instruction he required? Surely that would not be the case if the Association were really carrying out the work it had set itself to do. This special committee had not, however, got very far with its labours, yet he would predict that it would suggest some considerable alterations in methods of working. What particular alterations the special committee would suggest time alone would show; but, unless something tolerably drastic and complete was suggested and carried out, he feared they would find that their occupation little by little would slip away from them. Let us, then, continued Mr. Stokes, proceed to examine ourselves and find out where the shoe pinches, and what remedy, if any, had better be applied. How has the voluntary system answered? Very satisfactorily, will be the reply; and I shall be the last to deny it—up to a certain point. So did the old stocking, but it has given way to the savings bank; and we have ourselves now reached that point when we ought to consider the advisability of realising a little better result on the capital and labour sunk in the undertaking. In its early days, when the Association numbered some two or three hundred members, our present voluntary system may have worked, and no doubt did work, admirably; but since then our numbers have quadrupled, and of late years our system has been strained to its utmost, and has shown evident signs of giving way. Now, how is this? Well, there are various reasons, and I must ask you to examine these reasons, and to face boldly whatever conclusions they may lead you to come to. If you will do this, and still remain of the opinion that our present system is the best we can adopt under the circumstances, then do not listen to any suggested changes. But if you agree with me that a change is desirable, then I shall look to everyone of you to assist in carrying out such a change. 1. It is against human nature to give away gratis that which we have taken some time and trouble to acquire for ourselves. Some disinterested people will do it, no doubt, with more or less regularity; but it does not come naturally to many of us. My views may be pronounced sordid—and so they may be; but men must live, as they will tell you for themselves; and I am simply stating facts as I find them. 2. Neither does it come naturally to us to value at their true value those things which we acquire for nothing, or with next to no trouble or expense. Getting a thing for nothing induces us to value it accordingly. 3. In the voluntary system we almost entirely lose all semblance of regular system. The man who gives his services will not be dictated to by another who is only acting in a similar capacity; and we must, therefore, take what we can get, in the way it is offered, and be thankful. If, however, you were to pay your instructors, your committee could decide what was required, and request the lecturers or visitors to act accordingly. 4. In casting about for voluntary helpers in a field naturally somewhat limited—for even visitors and lecturers in order to live must look for a *quid pro quo* in one form or another for the time and labour spent in or upon a class or course of lectures—as a natural result, the powers that be have sometimes to appoint men that might not be considered the most suitable if there were a salary attached to the post. 5. In order to obtain suitable visitors for most of the classes, it was arranged some few years back that each visitor should only be asked to attend on two or three evenings during a session. This had the desired effect of inducing men to become visitors; but has it not had this bad effect upon the classes—that the visitors individually never get to know the members of a class, and the members of a class never know their visitor? Continuity being thus lost, loss of interest is the result, since the class generally degenerates into a series of independent meetings. 6. In our voluntary system we work the willing horse, and to such an extent as to interfere unreasonably and unfairly with his private prospects. It is to our honorary secretaries that I more particularly refer. How they get through their work in the admirable manner in which they do I cannot conceive; and I do not even wish to suggest that the work could be better done—as I know it could not. But it is not fair or just to expect any man to give up his time, often whole days together, in the way that our secretaries are expected to do. Some of our other officers have very hard work to do, and manage to get through it admirably; but our honorary secretaries are over-worked, and should be relieved without delay. Several of your past presidents have dwelt in their opening addresses upon the fact that our system was capable of considerable improvement, and hinted, more or less strongly, that some serious steps should be taken to achieve such improvement—Mr. Gotch calling "our present system of teaching a stop-gap, and desiring that the function now fulfilled by the Architectural Association on the voluntary system should devolve upon an authority recognised by the profession," and Mr. Slater "doubting whether voluntary work is adequate or the best." We, as a nation, find it to our interest to make ourselves responsible for the elementary education of the community. Therefore, should not the smaller we, as a profession, recognise the desirability of becoming responsible for the technical education of our students? I do not mean that we can, but that the whole profession, through its representative body or bodies, should take the matter in hand, and do its utmost to forward architectural education. The Royal Institute of British Architects is the one body that represents, far more than any other body in the three kingdoms, our profession; but what do we find it doing for education? It certainly has instituted a series of examinations for those who wish to join its ranks; and it hopes by so doing that in time membership of the Institute will carry more weight with it; and that, recognising this to be the case, the public will look more and more to the Institute for information and guidance in matters architectural. This, of course, all tends indirectly to raise the tone, and also the standard of education in the profession; but it is not in itself education. Therefore, the Institute as a body is doing nothing directly to educate the younger members of the profession. It has, however, lately called into existence a new class of members—or, rather, revived an old one—viz., "Students"; but, as far as one can tell, from what it makes known to the public, the Institute does not at present, at any rate, propose to instruct (!) these students in any way, but simply to examine them at certain stated intervals. Should we not approach the Institute on the subject, and endeavour to obtain their co-operation and assistance in this great work? The late Mr. Street was, in his latter days, anxious to see our Association and the Institute working more together, instead of in separate grooves, as they now are, and in his admirable opening Address to the Institute in 1881 he referred to the subject at some length. I am fully alive to the fact that Street's suggestion was not received with favour by the Association at the time, and that the matter was dropped. But that was eight years ago, and since then some of our leading members who were at the time opposed to the idea have changed their views on the subject, and now see that considerable advantage might be derived by following some such scheme as Street proposed. We also must not forget to allow for eight years' change in the two bodies themselves, and, in fact, in the whole situation. What was then desirable is now doubly so, for the reason that architectural education is recognised now to be of far greater importance than ever. Strictly speaking, the Institute, as the acknowledged representative body of the profession, is the proper executive for carrying out whatever work the interests of the profession at large call for—educational or otherwise. But if it will acknowledge and help the Association in such a way as to practically endow it with the authority of the whole profession, then the Institute might be said to be, at any rate, contributing very largely to the work of architectural education. As the Institute is evidently alive to the importance of professional education, and as we are clearly of the same opinion, would it not be well if the two bodies could join hands and work together, instead of separately, for this their common object? By so doing, I believe, they would form the means for establishing, and effectually maintaining, a comprehensive system of architectural training, based upon experience in such work, and endowed with the moral and material support of our whole profession. The Association, as an independent society, would, of course, still continue to do good work, as it has done in the past, and the Institute would not have to apply for any new charters; we should simply undertake to do conjointly what it would be much harder and more inconvenient to do separately with equal efficacy—viz., forward the technical education of our profession. I will endeavour to show you what advantage would accrue to us from such an arrangement. But, first of all, it would, of course, be necessary that the Institute should agree to work with us. They might decline in '89 to have anything to do with us, as we did in '81 to have anything to do with them; but I hope and believe they would not come to any such conclusion. In appointing our visitors and lecturers, we should, if we were working with the Institute, be able to draw them from either our own list of members or from theirs; and, besides this, we should be in a position to offer them fees, which, if not adequate in themselves all at once to repay the lecturers for all the time and trouble expended, yet might make it worth their while to accept such posts, when taken in conjunction with the fact that such offices were filled by the nominees of both the Association and the Institute, thus reflecting a certain distinction upon the holder thereof. It would be considerably to our advantage if we could thus get a stronger list of visitors and lecturers to help in the Association. Men who have a gift for, and who are prepared to make a business of, teaching are much wanted in our profession, and such a body of men might be called into existence under some such system as I am suggesting. Again, with the Institute to help us, we might reasonably expect to be able to collect enough money, either in capital to endow certain chairs, or in yearly subscriptions, to support the same. In our city we have numerous very wealthy companies which exist ostensibly for the benefit of certain trades. Unfortunately we have no Worshipful Company of British Architects; but if it were pointed out to the companies that do exist that it really is to the architect to whom they look for good designs and good construction, they might assist in educating the man to whom they eventually turn for help. What is the use of registering a plumber if an architect designs bad plumbing and will have it carried out? or of giving a certificate of proficiency to a carpenter if the architect provides him with a design unsuited to the material in which it is to be executed? There must also be many in the profession who would help us if they felt confidence in us, and greater confidence would be placed in us if it were known that the Institute was in some way officially connected with us. We might also reasonably expect the Institute to help us with its purse, for, although I am perfectly aware that at present the Institute is not too well off, yet, with a little judicious saving in its expenditure, it might find that it could help pretty effectually. Having pointed out how we should gain by being recognised and helped by the Institute, I will direct your attention to what we should do for ourselves in the way of raising funds—for funds we must have if we are to carry on our work in a satisfactory, and not merely in an amateurish, manner. Letters on the subject of raising money for the Association have appeared of late in the professional papers and in our own *Notes*; but, though I admire the writer's enthusiasm and energy, I cannot agree with all his views on this subject. However, if he can only enable us to raise half the sum he mentions, we shall do very well indeed to begin with. But, before asking others—except perhaps the Institute—to help us, we certainly ought to show that we are in earnest ourselves, and in order to do this we should raise our annual subscription to a guinea. Our present subscription of half-a-guinea is quite inadequate to carry on all the works we now have in hand. It is also ridiculously small when compared to the subscriptions paid to other somewhat similar professional societies. Some few years back, as you will remember, it was proposed to raise our subscription; but the general body did not agree to the proposition, thinking that if they could get all they wanted for half, why pay a whole guinea. But things have changed since then, and we are every day being more looked to as an educating society. I feel convinced that if our members felt that by raising our subscription they were enabling their executive to provide for them really able and reliable instructors, they would at once, and with pleasure, pay the increased subscription. Architects know as well as anybody the value of money, and what to expect for their money; show them that by paying the extra half-guinea they will get value for the

money, and you may await their decision with confidence. Men pay their guineas to the various classes and lectures established outside our body because they feel that these classes and lectures are worth the fee; and they would do so in our case for the same reason. Another way to augment our funds would be to charge fees for the privilege of joining the the various classes. The shilling or two now paid to defray the out-of-pocket expenses of the classes, as now arranged, should be raised to something that would leave a balance, after paying expenses, to go towards paying the lecturers or visitors. The fees might be kept as low as practicable, but it would be only reasonable and business-like to charge them. With more funds at our disposal the library might be improved. And if a series of afternoon classes could be established, which members who were in their articles, or who happened to have time at their disposal, could attend, it would be no inconsiderable advantage to many of our members, who are expected at present to cram all the work they do at the Association in as overtime. If we were to hold such classes, as we are at present constituted, I doubt if we could work them; but if the Institute would recognise and assist us to work them they would be a great success. But first of all, members of both the Association and the Institute having pupils or improvers would have to be sounded as to whether they would support such classes by encouraging, and also insisting that, as far as they were able, their pupils should attend them. Something in the nature of a drawing school would also be a valuable adjunct to this Association, but would require considerably more funds to keep up than are at present available. In conclusion, the President said: I have now shown you the defects of our present voluntary system. I have tried to insist that if we are to pose before the world as a teaching body we should adopt more efficient methods than our present ones, and I have given you the opinions of some others on this subject. I have likewise tried to show you the folly of our trying single-handed to cope with an undertaking of such magnitude, and have suggested that we should—with their concurrence—work with, and obtain the assistance of, the Institute in this work. I have shown you how we should gain by accepting the assistance of the one body that really represents the whole profession. I have suggested ways for obtaining funds, for carrying out various improvements, and also for systematising, consolidating, and thereby greatly strengthening the work we are now doing in the profession. I have pointed out in these suggested means for raising funds that we may confidently look for help to others, but insisted that we ought to show that we ourselves are in earnest by first doing what is obviously necessary—viz., raising our annual subscription; and, having done all this to the best of my ability, I now call upon each one of you, as members of this Association, upon each member of the Institute, and also upon every architect outside these two societies who has the smallest degree of sympathy with our undertaking and love for his profession, to unite and to the best of your ability help forward the great cause of architectural education.

Mr. H. L. Florence, past president, proposed a vote of thanks to the President for his address, and he agreed that the subscription to the Association must be raised. He believed that the Institute would support them in any well-devised scheme, if approached by the Association. Mr. John Slater, past president, in seconding the motion, expressed a hope that jealousy of the Institute would not prevent the Association from accepting any help that might be offered. Mr. Cole Adams, past president, said when they proposed a few years since to raise the subscription, they met with opposition because they went the wrong way to work; they suggested that old members should double their subscriptions, and met with demur, whereas, if they had proposed that all members joining after the current session should pay a guinea there would have been no opposition. He feared if they abandoned the voluntary system the Association might sink into a mere teaching college, and might lose that *esprit de corps* and enthusiasm which had made it such a success. Mr. C. H. Brodie also supported the vote of thanks, which was carried by acclamation, and suitably acknowledged by the President.

The ground story of the tower of St. John's, Penzance, being built by Mr. Carah, of Crowan, was dedicated on Friday evening.



SCAFFOLDING.

A FEW weeks ago I noticed an article on scaffolding in the Building News; and also a letter questioning the economy in using steam cranes in lieu of the same.

It is certainly an interesting question as to whether the employment of steam cranes, and so dispensing with heavy scaffolding, is economical or not.

Having been for the past few years connected with various buildings in Paris and the north of France, I have had the opportunity of observing the various systems employed in this country. Of course, in brick buildings and others of minor importance, ordinary scaffolding is used, with the usual hoisting gear. But in large constructions steam cranes are fast coming into use, to the exclusion of all exterior scaffolding. The "Palais des Beaux Arts," of Lille, on which I am now occupied, a building which will cost nearly 4,000,000 francs (architect, Monsieur Ferdinand Delmas), was built from foundations to cornice by means of steam cranes, no exterior scaffolding whatever being used. The crane, on the balance system, gave every satisfaction: blocks of stone weighing nearly eight tons were easily hoisted and then carefully lowered to their places in the walls. Rails laid at a certain distance from the walls around the whole building allowed for the sideward movement of the machine, the rate of speed attainable being from 30ft. to 40ft. per minute. 2,500 cubic feet have been posed in one day's work with this crane. Counting all this, there is no doubt that the crane, as regards economy and speed, supersedes scaffolding, especially in the case where the stone is dressed and carved before building. In the case of the "Palais," as the stone used was soft, the blocks were only rough-cut before posing; a light scaffolding being raised for the work going on at present, of moulding and carving the exterior.

But with all the advantages as regards speed and economy, the crane has many drawbacks. The necessity of careful supervision during the bedding of the blocks is absolute, as once the stone is posed it is next to impossible to get at the lower joint for examination. Again, if the building is at all large, several cranes have to be employed; for as the sideward motion of the machine is comparatively slow, portions of the walls are liable to be built considerably above the rest, thus throwing undue and unequal strain on the foundations. But still, with careful management and strict supervision, there is no reason why the steam crane should not be employed on large buildings, to the saving of time and expense. I inclose you a sketch of the "grue roulante" as at work.

Lille. Arthur J. Vye Parminter.

[Many thanks. Can't you induce M. Delmas to send us a drawing of the building and plans, for reproduction?—Ed.]

INJURIOUS EFFECTS OF VIBRATION ON BUILDINGS.

IN buildings fitted up as factories and printing offices, where engines are employed, attention should be given to the speed or vibration of the engines. The point to determine is whether the speed of the engine bears any relation to the time of vibration of the floor or its beams. Should the vibration of both engine and floor be in unison, there is great danger of shaking the structure; but if they are not in unison, or the pulsation of the engine does not beat in time with the floor vibration, there is comparatively little

harm. The time or vibration of the floor-beam will depend on its length, and therefore an engine of high speed is less likely to do damage to the structure if it has a large floor, than one of slow speed. It has been pointed out also that the vibrations of a fast-running engine are more numerous and less forcible, and are resisted easier by the mass of the floor. We all have realised the import of equal-timed vibration in the ringing of bells in old church towers, also the effect which the tread or tramp of a number of persons will have on a floor or bridge which is not very strong. By timing the tread or the motion of our bodies to the floor vibration, the floor may be made to visibly vibrate. To insure safety, therefore, an engine should be placed on a floor the natural vibrations of which are in discord with those of the engine. When a slow-running machine is used on a floor, the vibration of which creates an unpleasant shaking of the building, the effect will be immediately altered by increasing the number of revolutions in a given time, or by putting another beam under the floor, which will prevent the synchronism in the vibrations. We have known many solid buildings seriously affected, and the walls fractured by the vibration of machinery on an upper story, and engineers would be exercising their proper function by providing for this contingency before fixing machinery on the floors of buildings.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—LVI.

By Henry Lovegrove, F.S.I., Surveyor.

A VILLAGE ELEMENTARY SCHOOL.

WINDOWS CONTINUED.

TWO LIGHT WINDOW, CLOAK-ROOM.

ft.	in.	ft.	in.	
2	13 9			
	4			
	3	2	4	Frame as before.
2	10 3			
	4			
	3	1	9	Add above transom.
2 2	2 6	10	0	5in. by 2¾in. oak sill as before.
2 2	2 6	10	0	Galvanised iron tongue and groove in oak and stone, and white lead, and bedding sill in white lead.
	4			4. Small frames, bedded and pointed.
2	2 1			
	4 5	18	5	2in. deal moulded casements as before.
2	2 1			
	2 8	10	2	
				4. Pairs 3in. brass butts.
				2. Tonks' wedge casement fastener
				2. Do. stays.
				2. Elsey's openers as before.
2	1 11			
	4 3	16	4	Hartley's ribbed glass as before.
2	1 11			
	2 6	9	7	
				4. Frames 4c. white.
				4. Do. S.S. and twice varnish.
				28. Small squares 4c. white.
				28. Do. S.S. and 2ce. varnish.
	22 7			3in. by 1in. wrot. and rounded window lining as before.
	23 9			
	4½	8	11	Deal grounds.
	23 9	23	9	3in. architrave moulding mitred.
	5 9	5	9	Deal moulding 4in. by 2in. as before.
				2. Ends scribed to architrave moulding.
	4 9	4	9	4½in. by ⅜in. deal wrot. grounds,
	4 3	4	3	moulded both edges.
				4. Ends scribed.
	4 9	4	9	3in. architrave moulding mitred.
	3 0	3	0	
				4. Ends scribed.
	7 3	7	3	1½in. deal wrot. and rounded window board 4½in. wide, tongued to oak sill.
				2. Mitred and returned rounded ends to do.
				2. Notchings.
	7 3	7	3	Deal moulding out of 2½in. by 2in. under window board.
				2. Mitred and returned moulded ends to do.
	5 9	5	9	Groove in oak for window-nosing.
2	13 9			
	4			
	3	2	3	Frame as before.
2	10 3			
	4			
	3	1	8	Add above transome.
4	2 6	10	0	5in. by 2¾in. oak sill as before.
4	2 6	10	0	Galvanised iron tongue and grooves in oak and stone, and white lead and bedding sill in white lead.
				4. Small frames bedded and pointed
2	2 1			
	4 5	17	7	2in. deal moulded casements as before.
2	2 1			
	2 8	11	1	
				4. Pairs 3in. Brass butts.
				2. Tonks' wedge casement fastener.
				2. Do. stays.
				2. Elsey's opener as before.

ft.	in.	ft.	in.	
2	1 11			
	4 3	16	3	Hartley's ribbed glass as before.
2	1 11			
	2 6	9	7	
				4. Frames 4c. white.
				4. Do. S.S. and 2ce. varnish.
				28. Small squares 4c. white.
				28. Do. S.S. and 2ce. varnish.
	22 7	22	7	3in. by 1in. wrought and rounded window lining as before.
	23 9			
	4½	8	11	Deal grounds.
	23 9	23	9	3in. architrave moulding mitred.
	5 9	5	9	Deal moulding 4in. by 2in. as before.
	2		2	Ends scribed to architrave moulding.
	4 9	4	9	4½in. by ⅜in. wrought grounds moulded
	4 3	4	3	both edges.
				4. Ends scribed.
	4 9	4	9	3in. architrave moulding mitred.
	3 0	3	0	
				4. Ends scribed.
	7 3	7	3	1½in. deal wrought and rounded window board 4½in. wide tongued to oak sill.
				2. M. and R. Rounded ends to do.
				2. Notchings.
	7 3	7	3	Deal moulding out of 2½in. by 3in. under window board.
				2. M. and R. moulded ends to do.
	5 9	5	9	Groove in oak for window nosing.

WINDOW TO STAIRS.

4	12 3			
	4			
	3	4	1	Fir frame as before.
2	9 5			
	4			
	3	1	7	Add do.
6	2 6	15	0	Oak sill as before.
6	2 6	15	0	Galvanised iron tongue and grooves in stone and oak, and white lead and bedding sill in white lead.
				4. Frames bedded and pointed.
				2. Small do., do.
6	2 1			2in. deal moulded casements hung on
	3 8	45	10	butts.
2	2 1			
	2 3	9	4	Add do.
				8. Pairs 3in. brass butts.
				2. Tonks' casement fastener.
				2. Do. stays.
				2. Elsley's patent openers 8ft. from floor.
				2. Ditto do. 11ft. from floor.
4	1 11			Hartley's glass as before in small
	3 5	26	2	squares.
	1 11			
	1 10	3	6	Add do. in do.
				4. Frames bedded and pointed.
				4. Frames 4c. white.
				2. Small do. do.
				4. Frames S.S. and varnish.
				2. Small do. do.
				42. Small squares 4c. white.
				42. Small squares S.S. and 2ce. varnish.
	26 10	26	10	Deal linings rounded and tongued to frame as before.
	28 0			Deal wrought and moulded grounds
	4½	10	6	as before.
	28 0	28	0	3in. architrave moulding as before.
2	5 6	11	0	4in. by 2in. deal moulding on transoms as before.
				4. Ends fitted.
	10 6	10	6	Deal grounds moulded both edges, 4in. wide.
				6. Ends fitted.
	7 0	7	0	1½in. deal wrought window board as as before.
				2. Mitred and returned rounded ends.
	7 0	7	0	Deal moulding planted on rounded window board.
				2. Mitred and returned moulded ends to ditto.
	7 0	7	0	Groove in oak for window board.
	26 10			
	4	8	11	S.S. and 2ce. varnish on linings.
	28 0			
	1 0	28	0	Add on grounds.
2	5 6			
	8	7	4	Add on mouldings.
	10 6			
	1 0	10	6	Add on do.
	7 0			
	1 6	10	6	Add on window nosing, &c.
	5 4			
	10 3	54	8	1½ B. ddt. in mortar.
	7 5			Ddt. extra to Kentish rag random
	10 3	76	1	facings as before.
	5 6			Ddt. extra to fair face and 2ce. dis-
	10 6	57	9	temper walls.
	5 10			Extra to fair axed arch in cement in
	9	4	4	2 rings as before.
	5 6			
	4½	2	1	Add soffit.
	5 6	5	6	T-piece 4½in. soffit.
2	9	1	6	Fair cutting in stocks.
	5 10			Rake out cement joints and point with
	9	4	4	mortar.
				8. Wood fixing slips.
				8. Lead plugs and runs in Bath stone as before.

MASON.—WINDOWS.

ft.	in.	ft.	in.	
4	7 6			Stone and all labour in sunk moulde
	1 2			and rebated window-head, first floo
	1 0	35	0	front and back.
8	11			
	1 2			Do. in moulded and rebated windo
	6 0	51	0	jambs.
4	1 8			
	1 2			Do. in do. sunk moulded for tran
	6	3	10	some.
4	4 6			
	1 0			Do. in stopped moulded and doubl
	6	9	0	rebated transome.
4	6			
	1 0			Do. do. in mullion moulded an
	6 0	12	0	double rebated.
4	7 0			Do. in sill sunk and weathered, wit
	1 2			moulded stools worked thereon fo
	1 0	32	8	jambs and mullion.
2	7 6			
	1 5			
	6	10	7	Do. in moulded string under sill.

FOUR-LIGHT WINDOW, FIRST FLOOR.

	13 5			Stone and all labour in sunk, sto
	1 2			moulded, and rebated window-head
	1 0	15	8	with sunk joints.
2	11			
	1 2			Do. in moulded and rebated windo
	6 0	12	10	jambs.
2	1 8			
	1 2			
	6	1	11	Do. in do. sunk moulded for transom.
2	4 6			
	1 0			Do. in sunk moulded and doubl
	6	4	6	rebated transom.
2	6			
	1 0			Do. in moulded and double rebate
	6 0	6	0	mullion.
	10			
	1 2			
	6 0	5	10	Do. do.
	13 2			
	1 2			Stone and all labour in sunk weathere
	1 0	15	4	sill as before.
12	1			
	1 5			
	6	8	6	Do. in moulded string under sill.

TWO-LIGHT WINDOWS AT BACK, FIRST FLOOR.

4	7 0			
	1 2			Stone and all labour in sunk, moulded
	1 0	32	8	and rebated window-head.
8	11			
	1 2			Do. in moulded and rebated windo
	6 0	51	4	jambs.
8	1 8			
	1 2			
	6	7	9	Do. in do., sunk moulded for transom
4	4 6			
	1 0			Do. in sunk, moulded, and doubl
	6	9	0	rebated transom.
4	6			
	1 0			Do. in moulded and double rebated
	6 0	12	0	mullion.
4	7 0			
	1 2			
	1 0	32	8	Do. in sill, stopped, sunk, and weathered as before.

WINDOWS, SIDE ELEVATION, FIRST FLOOR.

2	3 9			Stone and all labour in sunk, moulded,
	1 2			rebated window-head to w.c. and
	1 0	8	9	kindergarten.
4	11			
	1 2			Do. in moulded and rebated window
	6 0	25	8	jambs.
2	3 9			
	1 2			Do. in sunk, moulded, and double
	6	4	4	rebated transom.
2	4 0			Do. in sill, stopped, sunk, and wea-
	1 2			thered, with moulded stools for
	1 0	9	4	jambs.

TWO-LIGHT WINDOW TO KINDERGARTEN AND STAIRS.

2	7 0			
	1 2			Stone and all labour in window-head
	1 0	16	4	as before.
2	11			
	1 2			Do. in moulded and rebated jambs as
	3 8	7	7	before.
2	7 0			
	1 2			Do. sill as before, but with moulded
	1 0	16	4	stools for mullion.
	6			
	1 2			Do. in moulded and double rebated
	3 8	2	0	mullion.
2	11			
	1 2			Do. in moulded and rebated jambs as
	9	1	8	before.
4	1 8			
	1 2			
	6	3	11	Do. in do. sunk moulded for transom.
2	4 0			
	1 0			Do. in sunk, moulded, and double
	6	4	0	rebated transom.

Under the auspices of the Worshipful Company of Plumbers, a public meeting was held at the Guildhall, Lincoln, on Saturday, at which the Registration system was discussed, and a district council formed for the city and county of Lincoln, including the mayor, Mr. William Watkins (a leading architect in the city), and the medical officer of health.

MARBLE MOSAIC.

THE annexed design is a border in marble mosaic, executed by Messrs. Mainzer and Kempthorne, at the new premises of the Lancashire and Yorkshire Bank at Manchester, and is, so we are told, now on view at the Arts and Crafts Exhibition, Regent-street.

SCOTTISH NATIONAL PORTRAIT GALLERY.

THE collection of pictures and sculpture comprising this Gallery has been greatly augmented since the first nucleus was exhibited in the temporary building erected for it on the site, when it attracted but little notice. It now contains 160 paintings, of which about 70 are the property of the Gallery, the others being lent for a lengthened period, mostly by the National Gallery and the Antiquarian Museum. In addition to these, another 70, from private sources, have been lent for a shorter period, not less than two years. The sculpture comprises about 50 pieces. There is also a goodly collection of medallion portraits by Tassie, Henney, and Wedgwood, and 71 casts of Scottish portrait medals, presented by the trustees of the British Museum.

The building, however, in which it has found its permanent home is far from being completed, and still stands within the builder's hoarding, while the eastern extremity is little more than half finished. It is easily seen that the completion of the east and west elevations, comprising subordinate apartments, gives much more of variety and character to the design, which needed something to relieve the severe monotony in the arrangements of details in the main façade.

The Gallery has already become very popular with the public. It must not be forgotten that it owes its existence to the liberality of a citizen, who offered £10,000 towards its formation to the Board of Manufactures, on condition of their securing a like sum from the Government. This offer, made in 1882, was accepted by the Board, and in the following year the necessary amount was voted by Parliament to carry out the scheme. This measure of success was followed shortly by another offer by the same anonymous donor, which set at rest all anxiety as to the provision of a suitable home for the Gallery, and not only so, but with it came the offer to provide similar accommodation for the Museum of National Antiquities—much hampered for want of space in the rooms of the Royal Institution. The only condition attached to the offer was the provision by the Board of Manufactures of a site suitable for a building of the character required. The present site in Queen-street accordingly was procured for £7,500, of which £5,000 was given by the Treasury. At the opening of the Gallery, the county and city had the satisfaction of learning that they are indebted for one of the finest buildings, and one of the most important historical collections, to Mr. Finlay, of the *Scotsman*.

Only the small portion completely finished is as yet opened to the public—viz., the apartment on the first floor of the western division, with the hall and staircase. The plan of the whole has been carefully designed to make the most of the space available, which is long in proportion to its depth; and of this full advantage has been taken, as the ground-plan may be said to be a simple parallelogram without any considerable projections. It is apparently divided into two equal and similar sections, separated by the large central hall. The eastern half is reserved for the Antiquarian Museum and the western for the National Portrait Gallery. The collection now exhibiting is large enough to be sufficient equipment for the apartment on the first floor, the principal one of the three composing this division. The arrangement of this floor and that beneath it is nearly alike, space for hanging the pictures being provided mostly on the end walls, and screens erected opposite the three piers of the four large windows to front and back. The apartment is divided longitudinally by an arcade supporting the constructive beams of floor and ceiling, the arches corresponding with the windows. The walls are all lined with wood. The construction of floor and ceiling is the ordinary arrangement of compound girders. But in the finishing of the ceilings the ironwork is not, as is usually done, concealed by ornamental plasterwork, which very soon gets dirty, and generally dirtier in proportion to the elaboration of details. In the Gallery, the walls being coloured a sage green, the soffit plates of the ironwork are painted an Indian or dull red, forming it into a number of well-proportioned panels, each of which has a marginal moulding of wood round the plaster-work. The webs of the large box girders are painted somewhat lighter than the walls. The effect of the whole arrangement is both novel and pleasing to the eye. The Gallery is entered by a central door in each of its two compartments. The heating is provided for by a number of ventilating water coils, arranged as pedestals for statuary.

The staircase and hall also make special provision for the statuary, so that at almost every turn the visitor has something to divert his eye from the somewhat sombre and depressing effect of the red brick walls which surround him on every side.

The large central hall is designed, as in large mansions, with the height of two floors, having corridor passages on the ground floor and a gallery above. The sides of the hall are formed by an arcade of three bays, with clustered piers at the angles and circular between. All the arches have the effective richly moulded lines of the best Decorated Gothic period. The capitals are still in block. On the ground floor the pavement is tesselated mosaic, and the staircase is of Portland cement concrete. At the south-east angle stands the full-size statue of R. Burns, by Flaxman, and which is seen to great advantage from the staircase. At each landing a small grey granite pillar pedestal, with beautifully-carved capital in red freestone, is fixed to the wall, and a similar pedestal is placed in the gallery of the hall opposite each opening in the arcade. These pedestals are all provided with busts. The hall is entered from three doors in a moderately-sized front vestibule, over which are private apartments, entered from the Gallery. The only details which may be open to some objectionable criticism are the somewhat indifferent pointing of the brickwork of the walls, and the glazing of the windows. The design of the timber sashes (perhaps to make their opening easy) can hardly be commended. The stonework tracery is Decorated Geometric Gothic, and the sash which is detached from and behind it is glazed in accordance with the popular fad of the day—to wit, with smallest lead squares on the top, medium-sized panes of glass under it, and with larger sheets below. The *raison d'être* of the tracery thus becomes a paradox to the spectator from without, and the black outlines of it from within, seen through the network of squares, large and little, formed by the woodwork of the sash, make the contrast so displeasing to the eye that one feels disposed to wish that the architect would take a thought and remove his modern windows so as not to rob the tracery at once of its useful purpose and its beauty.

The section which contains the more permanent exhibits is arranged—not very consistently, however—in chronological order. The first is a portrait of Queen Anne, by Sir Godfrey Kneller. The painter has given us a dark beauty, with ringlets, in dark blue robe, seated with the crown on a table at her side. The colours are well preserved, and the expression of the countenance indicates a party of some determination. Next but one is a good bust portrait of Oliver Cromwell, a copy after Robert Walker. 7 and 21 are portraits of James VI.—the former when about 30 years old, the latter as a boy, both by unknown artists. 17 is the Chevalier St. George, also by an unknown artist. 18 and 19 are small bust portraits of Mary Queen of Scots, very feeble in their execution, and disappointing expectation in respect of anything beautiful or interesting in the subject. There are also full-length portraits of the Georges and their Queens. 60 is a small full-length portrait of Sir Walter Scott, by Sir Francis Grant, bequeathed to the National Gallery by the late Lady Ruthven, for whom it was executed. It was taken when dictating his last novel, and is one of the best likenesses extant. 43, the portrait of Robert Burns, is a small half-length, seated, by Peter Taylor; it represents him in the fashionable attire of the period when he first came to Edinburgh, and more youthful than the ordinary likeness generally engraved. There are many excellent examples of Sir H. Raeburn, and one of the best is Neil Gow, in brown coat and tartan trousers, performing on his violin.

The collection of pictures on loan for a shorter period contains a great many subjects of interest, of which may be mentioned a portrait of James VI. by Jameson. It is a full length, and helps to remind the spectator of Sir Walter's description of his unkingly presence. The works lent by the Duke of Hamilton are numerous, including family portraits by Vandyke, Sir P. Lely, Sir Godfrey Kneller, and Dutch artists. The collection has portraits of many famed Scotsmen. David Hume, by Allan Ramsay, has a crimson cap over a smiling face, and a very dandy vest; Thomas Carlyle, by the late R. Herdman, is a likeness, executed with great technical skill, and gives one the impression of a rough diamond. There are two likenesses of Sir W. Scott, one by W. Simpson in Indian ink—a silhouette profile—and the other by Dan Maclise in outline; and many famous in their day, as lawyers, physicians, and divines, artists and philosophers.

ROBERT BOYLE AND SON, LIMITED.

THE directors of Robert Boyle and Son, Limited, ventilating engineers, London and Glasgow, have resolved, subject to final audit, to recommend a dividend of 12 per cent. free of income-tax on the ordinary shares of the company for the year ending September last, placing to the reserve fund one-sixth of the profits earned, and carrying forward £2,352 8s. 5d. The year ended has been the most prosperous since the formation of the company. The directors attribute this success and their consequent ability to pay such a handsome dividend, which has been declared at the same rate each year, to their constant study of the requirements of architects, and to the great and ever-increasing demand for the latest improved form of the self-acting air-pump ventilator, patented in 1882, and perfected in 1887, which, though much superior in design, make, and action, is now sold at 50 per cent. less than previous and inferior forms, constituting it not only the most efficient and ornamental, but the cheapest, ventilator in the market. The company have at present some very important contracts in hand, and in prospect at home and abroad, and plans have been prepared for the ventilation of the Canadian Houses of Parliament, Ottawa; New Municipal Buildings, San Francisco; the new Mormon Temple and the Mormon Tabernacle, Salt Lake City, &c.

At Nantwich petty sessions on Monday week, after a lengthened inquiry, Walter Webb, architect and surveyor, of Whitchurch, Salop, was fined 10s. and costs, or in default 14 days' hard labour, for having incited a labourer who had been ejected from an inn to resist the police.

A memorial stained-glass window has just been placed in St. Peter's Church, Burnley, by Mrs. Barnes, in remembrance of her husband. The work has been executed by Messrs. Cox, Sons, and Buckley, of London.

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ILLUSTRATIONS.

CASTLE ACRE PRIORY.—NEW MAGISTRATES' COURTS, BOOTLE.—PASSENGER STATION, DUNDEE.—"SUNNICOT," BENHILTON.—TOMB OF SIR HUMPHREY LITTLEBOROUGH AT HOLBEACH.—MAUSOLEUM AT ROOKWOOD.—THREE CHURCH MONUMENTS.

OUR LITHOGRAPHIC ILLUSTRATIONS.

CASTLE ACRE PRIORY.

This double-page plate of photographic reproductions furnishes selections from the camera studies of Mr. John L. Robinson, A.R.H.A., architect, of Dublin, the hon. photographer to the annual excursions of the London Architectural Association. They formed part of the collection exhibited a few weeks since at the Royal Architectural Museum, Westminster,* which was shown in illustration of the recent A.A. visit to Norfolk, Lincolnshire, and Cambridgeshire†. The upper picture represents the west end of the interior of the nave of Castle Acre looking out through the portal on to the ruins of the Prior's lodgings, where the projecting oriel will be seen. The grand proportions and elaborate detail of this once magnificent church can be readily gathered from this picture, which, likewise, includes the base of the S.W. tower. That on the north side of the front has gone, and the great Perpendicular window over the entrance has disappeared also. The ruins long served as a quarry for local mason's work and for mending the roads; but the late Lord Leicester put a stop to this vandalism a few years ago, and the remains are now fairly well looked after. The walls are highly elaborated with round-arched arcades, interlacing the one with the other, and so forming pointed arches. The very curious arrangement of the big arches inside over the entrance is worthy of note, and seems to indicate either an after-thought on the part of the designer, or, what looks more likely, a bungle, for which he is responsible, seeing tha tthe greater or governing arch, which is enriched with zigzag ornament, springs in a meaningless way off the string and over the responds of the minor arcades on the walls, while the depressed arch, which is contemporary with the other work, rises off the wall-shafts in an awkward fashion, leaving the spandrel to be filled with rubble masonry. The entrance arch is much lower, and is decorated inside, but the interior arching above has no reference whatever with the richer work outside, and so is not governed by it at all. Whether a satisfactory explanation of this curious piece of work has been found, we do not know: possibly those learned in such matters have discovered a solution. The west front has been sometimes illustrated, and in Britton and Cotman drawings of it will be found, as well as in Bloomer's "History of Castle Acre." The place is often visited by archæologists, and has frequently been described. It is certainly one of the great things to see in N. W. Norfolk, and the ruins are of great architectural interest, with the castle at the east end of the village, and the priory situated at the west. Castle Acre, rising above, and overlooking the valley, must indeed in its palmy days have been as important as it clearly was commanding and picturesque.

* See review in Building News for Sept. 27, 1889, p. 411.

† See reports of the proceedings, Building News, Aug. 9, 16, 23, and 30, Sept. 6 and 20th, 1889.

BOOTLE POLICE-COURTS.—SELECTED DESIGN.

The plan has been divided into two parts—namely, the administrative department, including the court, police-cells, offices, &c.; and the second, containing the housekeeper's-rooms, police dormitories, day-rooms, laundry, &c. The court is placed on the first floor, in the centre of the administrative block approached by a large staircase from the side entrance, giving access to the witnesses' corridor and waiting-rooms, and also to the public gallery. The magistrates'-room is placed in front of the building, having direct access to the court, with an entrance and staircase from the main front, and in conjunction with the magistrates' clerk's department; the staircase also communicates with the solicitor's room. Ample lavatory accommodation is provided on this floor. The chief constable's office is placed close to, and is in connection with, the magistrates' entrance, and is in the centre of the police clerk's department on the ground floor. The charge-office, search-room, and five cells are provided on the ground floor, and five cells in the basement, with a separate police entrance from the drill-yard. The recreation-room, prisoners' airing-court, &c., are placed in the basement. The police dormitories, laundry, &c., are approached from the drill-yard, and are on the upper floor, the lower portion being carried on iron columns, with steel joists, and forming part of the covered drill-yard. Mr. C. J. Andersson, of Liverpool, is the architect.

NEW STATION AT DUNDEE: CALEDONIAN RAILWAY.

This new station has two main-line platforms, each 258 yards in length, and two dock platforms, each about 200 yards in length; all of these may be used either as arrival or departure platforms. The covered shed is 150 yards in length, the western portion is 110ft., and the eastern portion 90ft. in width, the difference being caused by the waiting-rooms and other accommodation provided on the south platform. The roof of passenger shed is of steel. There are 15 transverse girders, with open triangular bracing, 10ft. deep at the ends and 10ft. 9in. at the centres. The underside of girders is 21ft. above the platforms, which are 3ft. above the rails. The spaces between the girders are spanned by simple triangular trusses 10ft. apart, carrying the purlins. The whole area of roof, including the ends of transverse girders, is glazed. On the north side of the passenger shed there is a cab-stand under a verandah. The platforms are paved with granolithic concrete. On the south platform there is a range of buildings, comprising left-luggage room, ladies' and gentlemen's waiting-rooms (1st and 2nd class), refreshment-rooms (1st and 2nd class), and rooms for guards, ticket collectors, porters, &c. The main offices are at the east end of the passenger shed, and face South Union-street, the frontage being 143ft. in length. The block has two square stories and attics. On the ground floor there is at the north end the parcel office, 40ft. 6in. by 31ft. 9in.; in the centre the booking hall, 49ft. by 35ft. 6in.; and south of this the telegraph office, station master's room, &c. This floor is 16½ft. in height of ceiling. On the first floor are situated the various offices of the traffic department, and in the attics there is a station master's house of four rooms and kitchen, and store rooms for books and papers of the traffic department. The first floor and attics have 13ft. height of ceilings. The style adopted for the elevations of the front buildings is the Scotch Baronial, with crow-stepped gables flanked by circular turrets, and terminated at the south-east corner by a clock tower about 24ft. square, and rising to a total height of 120ft., the sloping roof being slated. The clock is about 70ft. in height, and has three dials 7ft. in diameter. By arrangement with the Police Commissioners, the station buildings were kept back from the old building lines of the adjacent streets, so that these have been considerably widened and improved. There is a cab access with covered verandah in front of the book-hall. The principal elevations of the front building are built with red freestone from Corncockle Quarry, Dumfriesshire. The walls of passenger shed, offices on platform, &c., are built with red brick from Pitfour, relieved with white brick at the projecting corners, openings for doors, windows, &c., and the cornices, the belts, and cope being of white freestone. The front building is slated with light green slates from the North of England. The works were designed by Mr. Thomas M. Barr, M.Inst.C.E., district engineer, northern division, Caledonian Railway, and carried out under the superintendence of Mr. E. G. Moon as residential engineer. The contract for the passenger station was let about twelve months ago. The principal contractors are Messrs. Kinnear, Moody, and Co., of Glasgow. The total cost of the new station will be about £100,000.

"SUNNICOT," BURHILTON, SURREY, FOR MR. H. EVANS.

This cottage was designed for a cheap summer cottage, and to meet the requirements of the Model By-laws all the rooms on the first floor are contained in the roof; the weather-tiling is hung on rafters inclined 4 degrees out of the vertical. All the rafters are covered with selenitic breeze concrete to which the tiles are nailed. The work has been carried out by Mr. E. J. Barnard, of Wallington, under the direction of Mr. Herbert D. Appleton, F.R.I.B.A., 157, Wool Exchange, Coleman-street, E.C.

SIR HUMPHREY LITTLEBURY'S TOMB IN THE CHURCH OF ALL SAINTS', HOLBEACH, LINCOLNSHIRE.

This fine Mediæval tomb has been removed to its present position at the west end of the north aisle of Holbeach Church, for it used to stand at the east end near the chancel. On it is the effigy of Sir Humphrey Littlebury encased in armour, the hands joined in prayer, the head resting on a woman's head in a net, and the feet supported by a lion. The whole must have been very rich in colour. The sides of the tomb are covered with roses, richly carved, and there are four niches with canopies. It is considered one of the finest specimens of its kind of the 14th century. Colonel Holles, when visiting the Lincolnshire churches just prior to the Parliamentary Wars, makes the following note about this monument in "Holbech Church, Linc." :—

"Juxta cancellum, Tumulus Lapideus cum effigie Viri super Scutum gestantis binos Leontes ambulantes ære obverso.....Littlebury.
Ex utroq Latere quinquies Littlebury and ter 3 Bars Ermyn .....Kirketon."
(See Harl MSS. 6829, p. 236.)

Stukeley in his "Itinerarium Curiosum" says, "There is a fine monument of the Littleburys, an ancient and flourishing family in these parts; upon his shield in his coat Argent two lions passant gardant Gules." In "The Monumental Effigies of Great Britain," by C. A. Stothard, London, 4to, 1817, there are two views of this monument of "Sir Humphrey Littlebury, from his monument at the west-end of Holbeach Church, Lincolnshire." "Sir Humphrey Littlebury: This effigy is in Holbeach Church, Lincolnshire; the border of the surcoat formed into leaves, the cuisses are semée with cinquefoils heads." Relative to the application of nails to body armour the following passage from [Memoirs of] Philip de Comines [book] seems to be in point. "The Dukes of Berry and Bretagne were at their ease upon their hobbies, armed only with gilt nails sown upon satin, that they might weigh the less." Then follows a short description of some of the enlarged details. It seems to have been the fashion in those days to represent these effigies as standing on animals, particularly what was meant for the lion. The more sensible of these effigies lay their heads on pillows; but many, like Sir Humphrey Littlebury, prefer the stomachs of men and women. In Gough's "Sepulchral Monuments, Great Britain" (London: 1796), in Vol. I. (part 2), p. 97, allusion is made to this monument at Holbeach. "The monument of Littlebury, in Holbeach Church, engraved by Dr. Stukeley [therefore not included]. It [may be] II. [the second vol. is meant, first plate] mentioned by him, Itin. I., p. 18, is by Mr. Brooke; from the arms referred to, Sir Humphrey Littlebury, Lord of Littlebury, who was living 1346. He married Elizabeth, daughter and heiress of Sir John Kirton, Knight, Lord of Kirton. His arms on the tomb and on his shield are A. two lions passant gardant G. Her arms on the tomb, single Burry of 6 Erm. and G. The doctor omits the Ermine." According to the "Visitation of Lincolnshire in 1652-64," edited by William Metcalfe, F.S.A. (London: Bell and Sons, 1881), "Hamon Littlebury, of Littlebury Manor, 1138, had a son, Humphrey,

who married the daughter of Simon Montford, and their son was John Littlebury, 1195, who married Jane, daughter of Robert Gonsall, of Gedney, near Holbeach. Richard Littlebury, 1215, was their son, and he married the daughter of John Lambert, and their son was Sir Martin Littlebury, Knight, Chief Justice of England, 1243 (28 Henry III.), who married Anne, daughter of Sir Henry Rochford, Kt. Their son, Sir Ralph Littlebury, Kt., 1268, married the daughter of William Shurley, and had a son, Sir Ralph, who married Isabel, daughter of Sir John Dawney, Kt. Sir Humphrey Littlebury was their son, there being also two daughters: Marion, who married Ralph Pulvertoft, of Whaplode, and Isabel, who married Laurence How, Kt. Sir Humphrey, by his wife, the heiress of the De Kirtons, became Lord of Holbeche, and his son was Sir Robert Littlebury, who married the daughter of Philip Tylney, of Boston, Kt."—Grant W. Macdonald, Vicar of St. Mark's, Holbeach.

MAUSOLEUM, ROOKWOOD.—DETAILS.

This sheet of large-scale drawings further illustrates this building, of which a view with two plans, appeared in the Building News for June 14th last, when an account of the work was given. The present illustration shows the working out of the pendentives and arcades, the general arrangements of which can be seen by a reference to the plans already named. The parts and sections herewith delineated are so clearly shown as to require no further description. The contractors for the marble work were Messrs. Farmer and Brindley, and Messrs. Hart, Son, Peard, and Co., for the bronze. Mr. Maurice B. Adams, F.R.I.B.A., is the architect.

THREE ECCLESIASTICAL MEMORIALS.

ST. DENYS' CHURCH, Warminster, known in Wiltshire as Warminster Minster, has been almost entirely rebuilt from the designs of Sir Arthur W. Blomfield, A.R.A., and is probably one of the finest specimens of the reproduction of an early 15th-century parish church in the kingdom. It was reopened early in the present year (see Building News, March 1, 1889). Recently a handsome new pulpit has been placed on the north side of the nave of the church. It is from Sir Arthur's designs, and is a memorial to late well-known residents of that town. In the main it is composed of fine-grained yellow magnesian limestone, with columns, base to body of pulpit, and cornice of polished Devonshire (red mottled) marble. The plinth and the treads to the steps are of blue Pennant stone. The angels that occur at the springing of the gables over the arches are in various attitudes of devotion, and the Early Naturalesque work at Southwell Minster was the *motif* for the carving upon the pulpit generally. Inside, cut in unobtrusive letters in the stone, is the inscription:—"+ To the Glory of God, erected in memory of George and Francis Vicary, by their surviving children George Thomas and Maria Bayly Vicary, 1889." The pulpit has been made by Mr. Harry Hems, of Exeter, who has carried out much other work in the church.

The recumbent statue of the late Bishop Moberly is part of a memorial erected in the south aisle of Salisbury Cathedral, and is also from the design of Sir Arthur Blomfield. The tomb is placed beneath a richly-wrought canopy of Hopton Wood stone. The figure itself is in whole alabaster—an unusually fine block, without a coloured mark upon it. The angels holding drapery, and the pedestal, are in coloured alabaster.

The monument to the late Bishop Selwyn was erected within a small chapel on the south side of the Lady-chapel, Lichfield Cathedral. The figure of the Bishop in full robes, and with pastoral staff, is recumbent upon a New Zealand mat, and is in white alabaster, the tomb under being in coloured alabaster. Both these monuments were executed by Mr. Thomas Nicholls, of Lambeth, S.E.

The new chancel of the church at West End, Southampton, costing about £2,700, is to be completed by about Christmas. The church was built about fifty years ago, and cost about £2,000, including tower and spire. The spire was greatly damaged by lightning some years ago, and was pulled bodily down. The new building is to be of Chandler's Ford red brick and white stone.

"BUILDING NEWS" DESIGNING CLUB.

THE following are the awards made in connection with the work executed by members of our Designing Club for the session 1888-9, the results being based on the analysis given below:—

1st prize of £10 10s., "D" in a circle, Mr. W. B. Dawson, 102, Tyrwhitt-road, Brockley, S.E., London.

2nd prize, £5 5s., "Judge Pitman," Mr. T. A. Cook, 112, St. George's-terrace, Liverpool.

3rd prize, £3 3s., "Unitas," Mr. J. Dall, 152, Dumbarton-road, Glasgow.

Hon. mention, "Zodiac," Mr. A. C. Breden, 35, Bucklersbury, E.C.

The following members deserve commendation for their work:—"Midland" (Mr. P. H. Currey, Little Eaton, Derby), "Medicine Chest" (A. H. Church, Finsbury), "Myth" (W. H. Ridler, Newport, Mon.), "Nemesis" (H. C. Rogers, Wakefield, Yorks), "Fairy" (T. H. Dean, Manchester), and "Neb" (B. Woollard, Alderney-road, E.)

ANALYSIS OF SUBJECTS.

A.—Police Station.—1, "D" in a circle; 2, "Unitas"; 3, "Nemesis."

B.—Suburban Villas.—1, "Judge Pitman"; 2, "Myth"; 3, "Zodiac."

C.—Small Town Church.—1, "Midland"; 2, "Medicine Chest"; 3, "Nemesis."

D.—Country Public Market.—1, "D" in a circle; 2, "Zodiac"; 3, "Myth."

E.—Gamekeeper's Cottage.—1, "D" in a circle; 2, "Fairy"; 3, "Unitas."

F.—Artist's Home and Studio.—1, "Judge Pitman"; 2, "Unitas"; 3, "Zodiac."

G.—Village Library.—1, "D" in a circle; 2, "Neb"; 3, "Judge Pitman."

H.—A Cocoa-House and Vegetarian Restaurant for a Country Market Town.—1, "D" in a circle; 2, "Judge Pitman"; 3, "Zodiac."

It will be seen from these positions that "Zodiac" is almost a tie with "Unitas," but not quite.

The following are the rules and conditions of competition for 1889-90, commencing from the present time:—

1. Drawings to be sent in 28 days after the publication of the list of subjects.

2. Usually two subjects will be given every month, from which a competitor may choose.

3. The drawings to be executed in firm black lines on white drawing-paper, in sheets of the absolute size of 22in. by 14in., with no washes or tinting in colour whatever. Outline to be the first consideration; but drawings may be slightly shaded with shadows executed wholly in line. Sectional parts to be shown in ruled "hatching" or blocked in. The scale to be used will be given with each subject.

4. Drawings to be forwarded unmounted, by post, care being taken to roll the short way of the drawing, as packages over 18in. long are not transmissible through the post.

5. On entering the class (which may be done at any time), each competitor is required to furnish his name and address, which must be written legibly on the back of each drawing, as a guarantee of good faith, the *nom de plume* the author intends to adopt being boldly marked on the front of each separate drawing.

6. Prizes of £10 10s., £5 5s., and £3 3s. will be awarded to the best series of designs, such series not to consist of less than six subjects. Our decision to be final.

7. Before awarding the prizes any contributor will be expected to furnish proof, if necessary, as to his age, and the time during which he has been engaged in professional pursuits, though no candidate need be strictly an architectural student.

8. We reserve the right of arranging the drawings for publication in any manner we deem necessary.

9. A critical notice of the designs sent in of each series will be given in an early issue following the receipt of the drawings.

FIRST LIST OF SUBJECTS.

A.—*A Doctor's House for a Village with a Surgery Attached.* Site with 45ft. frontage to main road, and houses on either side. Forecourt 15ft. deep from frontage line. Cost to be about £2,000. Accommodation to comprise two parlours and a study, the latter leading into surgery, which is to have a side entrance. Provide a good hall and a staircase, which is to be well out of view of the entrance door. Kitchen, scullery, and usual conveniences. Depth of site may be reckoned at 120ft., and the garden must not be spoiled by the back offices. On the first floor there are to be three bedrooms and a nursery, bath-room, and w.c., with ventilated lobby to it. On the upper floor provide four bedrooms and a box-room, with space for a cistern. Material red brick and stone, sparingly used. Tiles for roof, and plastered gables, which feature may be optional. Scale 8ft. to the inch.

B.—A study chimneypiece in walnut with bookcase wings running up to ceiling 9ft. high. Width of chimney-breast 6ft., recesses for bookcases, 14in. deep, one 3ft. 6in., and one 2ft. 9in. wide. Lower portion fitted for folios, with part of doors panelled, the rest being glazed. Slow-combustion grate, and tiles round it. No shelves above mantel. Scale inch to the foot. Elevation, plan, and section. Key sketch optional.

CHIPS.

A new Board school is being built at Carlton Miniott, near Thirsk, Yorkshire, to accommodate 139 children, from drawings prepared by Mr. Thomas Stokes, architect, Thirsk, and will cost, including site and fence walls, a little over £1,000.

Mr. Henry Godfrey, one of the oldest builders in Gravesend, died on Wednesday week, at the age of 78 years. Some 45 years ago the deceased was a member of the town council of that borough.

Corstorphine Free Church, near Edinburgh, was reopened on Friday after enlargement and improvement. The alterations, carried out from plans by Mr. J. Macintyre Henry, Edinburgh, give accommodation for 300 additional sitters. Behind the pulpit a semi-octagonal apse has been formed, with moulded arch and groined ceiling. The whole area has been reseated, and the building cleaned and redecorated. The heating is carried out by means of hot-water pipes, and the ventilation by air inlets and extract ventilators on the roof. The total cost will be £1,000.

At a committee meeting of the Belfast Corporation held on Monday, the Town Clerk reported that the parties interested in the White Linen Hall had agreed to sell the property for public purposes at £30,000. It was resolved to recommend the corporation to authorise an application to Parliament for powers to purchase the site and to erect a City Hall thereon, leaving a large open space around; also for power to borrow a sum not exceeding £250,000 for these purposes.

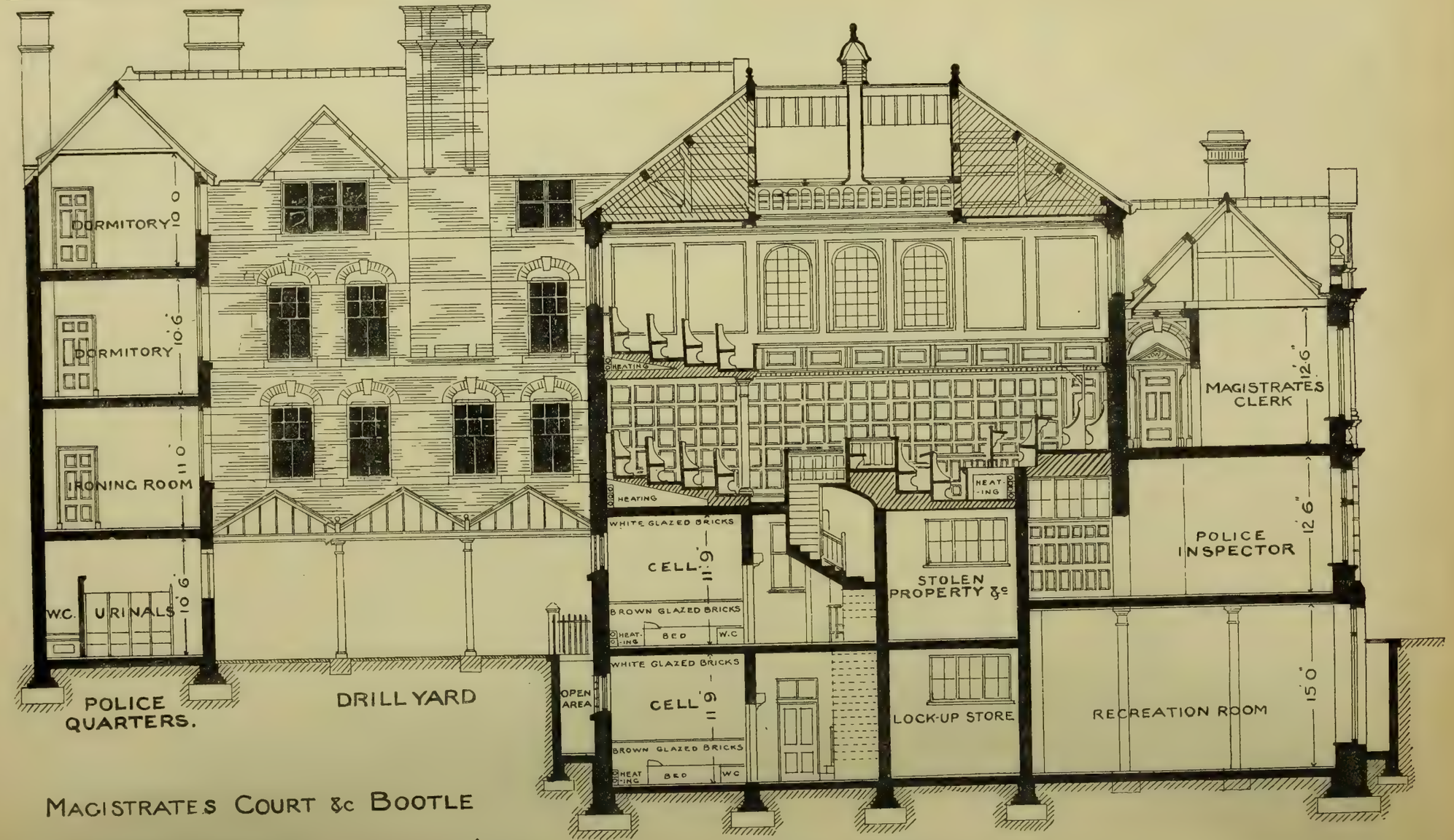
On Sunday week, All Saints' Church, Barrowby, Lincolnshire, was reopened after restoration. A new roof has been put on over the centre of the nave and south transept. Mr. Maxey, contractor, of Sleaford, has done the work, Mr. Kirk being the architect.

Mr. Thomas Lewis, architect and surveyor, of Newcastle-under-Lyme, died on Wednesday week. He rendered valuable service to the borough as a town councillor for a period of 20 years, having been elected in November, 1868, and retiring through ill-health in November last, since which time his strength has gradually failed. Mr. Lewis served the office of Mayor for the year 1876-7, and was appointed on the Commission of the Peace for the borough in September, 1885.

At the annual meeting of the Incorporation of Mary's Chapel at Edinburgh, held on Monday, Mr. George James Beattie, builder, was re-elected deacon of the masons, and Mr. John White, plumber, was re-elected deacon of the wrights for the ensuing year. Mr. White was at the same time also re-elected treasurer.

On Thursday, the 17th inst., the new No. 6 Dock of Messrs. H. S. Edwards and Son was opened at the Bull Ring, North Shields. The dock, which is 348¼ft. long, 52ft. in breadth, and 23½ft. deep, has been constructed by Messrs. Edwards's own workmen, under the supervision of Mr. Haswell, engineer.

The parish church of Salcombe, which was rebuilt in 1843, has just been enlarged by the addition of a new chancel, north transept, choir and clergy vestries, and organ-chamber. The work has been carried out by Messrs. Farr and Sons, of West Alvington. Two stained windows have been supplied by Messrs. Lavers and Westlake, of London. That in the chancel has five lights, and is dedicated to the late Earl of Devon, and that in the transept has three lights. The organ has been removed from the gallery to a special chamber adjoining the chancel, where are seated the choristers. The north transept has a wood-block flooring, recently patented by the contractors, and the floor of the chancel is laid in Hopton Wood stone and various coloured marbles. Dedication services were held on Friday. Mr. John D. Sedding was the architect.

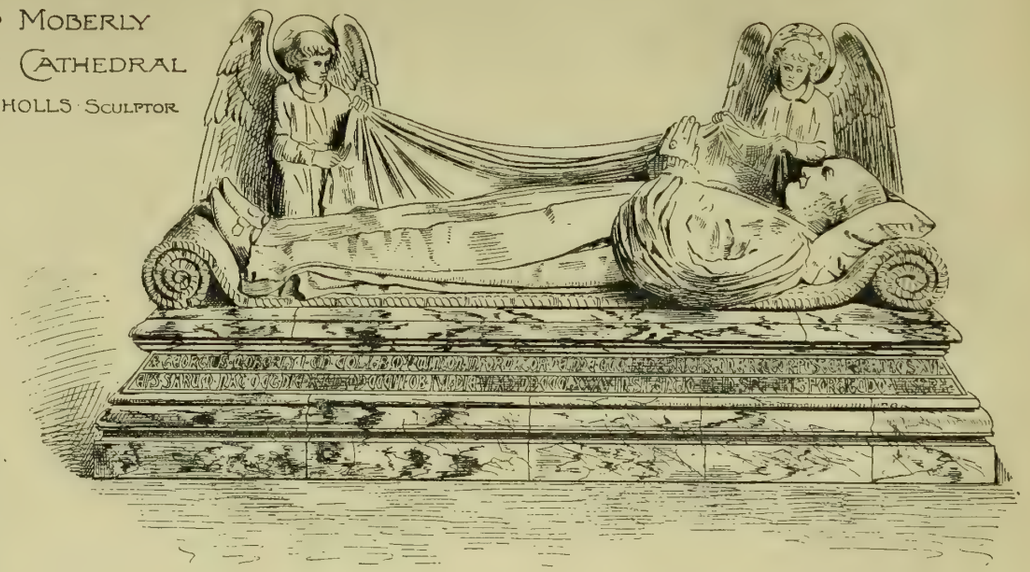


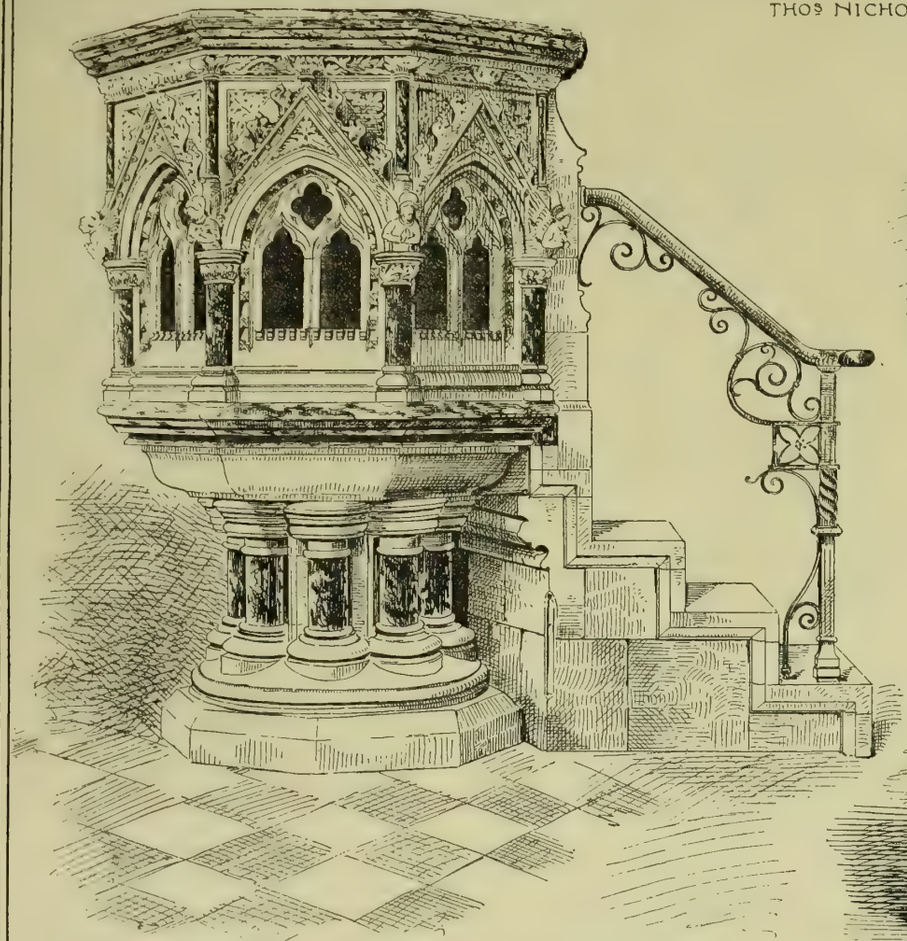
MAGISTRATES COURT &c BOOTLE

SELECTED DESIGN BY C.J. ANDERSSON ARCHT.

MAIN BUILDING. SECTION THROUGH COURT

Tomb to Bishop Moberly
in Salisbury Cathedral
Thos Nicholls Sculptor





Pulpit in St Denis' Church Warminster
Sir Arthur Blomfield A.R.A. Archt
Harry Hems Sculpt



Bishop Selwyn's Tomb
in Lichfield Cathedral
Thos Nicholls Sculpt

E. Chancellor Sel.

WAYSIDE NOTES.

EVERY succeeding president of the Architectural Association endeavours to appear practical and progressive upon the auspicious occasion when he delivers himself of his inaugurative and presidential address. This is only a very natural and proper desire on his part, the only drawback being that, where practical advice is tendered there is some disappointment and slight chagrin to face if the suggested measures and reforms are not carried out; whereas, a pleasant dissertation on current topics, even if it be lacking of purpose, entails no discomfiture of this nature. Now, Mr. Leonard Stokes need fear no eventuality of the kind named, for his discourse of last Friday contained no important points that have not been, over and over again, urged by others. The dominant idea—the union of the Institute and Association—has been mooted often before, as Mr. Stokes showed by his quotations from his predecessors in the chair of the A.A., and other previous writers and speakers on the subject. As regards this long proposed union, many have cried, and some may still say, *Cui bono?* For the moment, however, we may be content to regard the conjunction of these two architectural bodies as an event calculated to benefit the Association, and certainly the Institute. The R.I.B.A., indeed, ought to feel proud that the younger society has thus, through its President, "popped the question," and if the match is to come off the Institute must name the happy day—unless, as usual, it is too bashful.

Perhaps if new blood could be infused into the sluggish veins of the more elderly Conduit-street body, its lethargy might, in a measure, disappear, and we might have the product of R.I.B.A. plus A.A. enthusiastically turning its attention to Registration and other vital questions touching the well-being of the profession at large. Supposing that Messrs. the Members of the A.A. be drafted into the Institute as MM.R.I.B.A., eligible, on passing the series of examinations, for election as Associates, and that some slight power be given to the members to influence the destiny of the Institute, we might really see the drowsiness disappear, and vigorous, energetic life take its place. Who knows? The only discouraging thing about the matter is that we can call to mind the frequent complaints of the Associates that they have never been allowed their own fair share of power in controlling the doings of the Institute. This scarcely tends towards the belief that any body of young men holding somewhat the position of probationary members would be allowed a voice in matters. They would rather, like little children, have to be seen and not heard. However, time enough to speculate on these matters when the voice of the Institute is heard in reply to the proposal of the Association.

Work done for nothing is, we are told, generally worth what it is done for. I quite think with Mr. Stokes that the labourer is well worthy of his hire. The question of paying the lecturers who attend and instruct the various classes at the Association requires some consideration; but the desirability of remunerating secretary-work has been urged by me before now. The duties of the A. A. secretaries must, indeed, be arduous, and it is difficult to see how anyone can make it worth his while, even by virtue of the publicity and position accruing to him from the fact of his holding the post. If it be undesirable to have paid secretaries, let us have, as Mr. Stokes hints, paid assistant secretaries. Friends have complained to me of inattention from secretaries of the Association, but I have never hesitated to refrain from regarding these incidents as anything more than evidences of the great and undesirable strain put upon the gentlemen who have hitherto kindly undertaken to fulfil the duties of secretaryship.

Raising the rate of subscription of an old-standing society is a delicate matter at the best, and the proposal to increase the subscription fee of the Association from a half-guinea to one whole guinea is bound to raise much passionate opposition, just as it did during Mr. Cole A. Adams's year of presidency. Yet of the many ways of increasing the funds of the A.A. suggested at Conduit-street on Friday, the most practical is the raising of the subscription. It does, however, go terribly against the grain, as all will know who remember the determined stand taken by the section of members headed by Mr. Sedding, in which I had the honour to be included. But, looking at the question in all lights, a sum of ten shillings and sixpence is absurdly small for a society giving the instruction and instructive recreation that the Association does, and does thoroughly. On the other hand, I quite readily admit it may be urged that the vast bulk of those entering the ranks of the A.A. are of a class to whom a whole guinea is a really serious sum to lay out as a subscription, even to a society out of which the greatest good may be gained in the way of classes and lectures, visits, &c. If the Association is going in for large and extensive ideas, in the way of developing its scope of usefulness, it must have funds over and above that which it has hitherto commanded, and the question of raising the subscription forces itself to the front. Some, doubtless, would be ready to declare that "ambition is a grievous sin," and that the good old Association is better jogging along as heretofore, rather than launching out into schemes the end of which none can foresee. Whatever may actually be attempted, it seems to me probable that Mr. Stokes' year of presidency will witness another struggle over the guinea subscription fee.

Beyond a wish to outdo M. Eiffel, the origin of the proposed London Observatory Tower would appear to have come of a desire on the part of the Watkin family to live high and dry, as well as think and scheme big. Sir Edward's daughter is to have a châlet on the upper slopes of Snowdon, and doubtless Sir Edward himself will have his private rooms, like M. Eiffel, at the breezy summit of the Watkin Tower, if the new monster be safely delivered of the architectural or engineering and contracting parties. According to a representative of the *Pall Mall Gazette*, who interviewed Sir Edward on the subject, the scheme for its construction, or for arranging for its design and construction, has taken quite definite shape. To the respective members of the architectural and engineering professions, premiums of 500 and 250 *guineas*—not pounds this time—will be offered for the two best designs. Instructions, it is said, will be ready by November 1. Competitors must give estimates for (*a*) the weight of material; (*b*) the cost of lifts; and (*c*) the cost of labour, the latter requirement being remarkable for its ingenuity, seeing that the price of labour at any given date is a matter of uncertainty, and likely to rise in the near future. The designs will be adjudicated by a committee including, amongst others, Sir Frederick Bramwell, Mr. Benjamin Baker, Mr. T. A. Walker, contractor, and Sir E. H. Harland, shipbuilder, who have power to add to their number. The height stipulated is 1,200ft., and the design of the tower is a conundrum for ingenious architects and architectural engineers. I have only to express a hope that there will be gentlemen found who will endeavour to produce something which shall not be mere Eiffelism in principle, and, further, that, when erected, the affair won't be more of an eyesore in the metropolitan outlook than can possibly be helped.

The builders and contractors of London who complain of the action of the School Board in restricting the tendering for works to a few only of their number, seem to take unkindly to that to which the architectural profession has been meek and mild enough to knuckle down for years. The builders complain that *seven* only of their trade are by the new rule retained to carry out work for the Board. But they are just seven times better off than our poor selves. The whole of the architectural work for the School Board of London is in the hands of *one* architect; whereas there is work enough to legitimately occupy a dozen, who, if the school-buildings were put out to competition, would be recruited from one and another in the profession—now here, now there—so that the ratepaying architects would all come in for a chance of an occasional school building, as the ratepaying builders and contractors should do. Instead of which, there is an army of draughtsmen employed at so much per week each, to mark, *fit in No. so-and-so details to each façade as it comes along!* Is this architecture? This large army of draughtsmen distributed about the spacious drawing-office, and looking to the casual observer like a veritable nest of busy ants or bees, represent, in very truth, a body of gentlemen suffering from the effects of the system employed over against the Temple Station, since did architects receive their proper commission on the School Board buildings, increase of work to the profession would mean rise in the rate of assistants' pay. I daresay any good friends I may have in the drawing-office there will smile knowingly on perusing this, and not unkind strangers will clap a finger at the side of their nasal organs and look askance. But I maintain the reasoning is sound, and based on the laws of supply and demand.

Old St. Saviour's, or St. Mary Overie, in Southwark, is well worthy of being transformed into a cathedral church for the proposed South London diocese, to which the Bishop of Rochester recently alluded on the occasion of his delivering his charge to the clergy of his own diocese. The good bishop, among other things, spoke of the proposed restoration of St. Saviour's, at the cost of some £35,000, and urged that the work should be undertaken as soon as possible in view of the possibility of the building becoming the new cathedral church. Certainly anyone who did away with the present nave and some other portions of St. Saviour's, would be doing a good work, they being, I believe, in a very despicable *Early-Modern* Gothic style. But may prosperity follow, just out of reach, anyone who may essay to tamper with the lovely old Lady Chapel, gem of gems of Early English workmanship!

The crisis in the St. Alban's Abbey discussion seems likely to develop into a chronic ulcer. Any attempts to heal it had best be deferred, perhaps, till after the interesting piece of litigation to come off shortly—on the 5th, is it not? I should like to have eased myself of a few remarks anent the letters of last week, but must refrain for a season. Whatever may be the upshot of the discussion and litigation, it seems pretty evidently this time that, while interested parties are not likely to be open to argument, disinterested persons will not change their opinions one whit, even if their opponents write till all is blue.

GOTH.

CHIPS.

A south aisle which has just been added to St. Denys' Church, Southampton, was opened on Wednesday week. It has been built by Mr. Franklin, of St. Denys, from the original plans of the late Sir Gilbert Scott, from whose designs the church was built, and accommodates 200 additional persons.

Mr. John Henry Fulford, architect, of 34, John-street, Smethwick, Birmingham, was run over by a cab on Wednesday evening in Birmingham, and sustained fatal injuries.

The memorial stone of the mission church of SS. Simon and Jude was laid with masonic honours at Southport on Friday. Its design is a severe treatment of the Early English style adapted to the materials to be used—Burnley bricks, terracotta dressings, and Welsh slates. The nave and side aisle will seat 648 persons, school children finding accommodation in the chapel and extra vestry. A low screen will divide the choir and sanctuary from the nave. The doors will all open outwards, rather a novel arrangement in a church. Mr. J. Sutton is the architect.

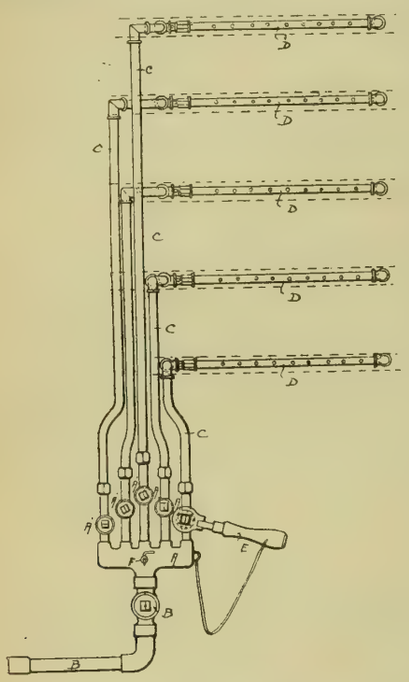
The only gold medal given at the Paris Exhibition, 1889 (British section), for Portland cement, has been awarded to Messrs. Francis and Co., Limited, cement manufacturers, Vauxhall, London, S.E.

Colonel Gillespie, who is in charge of the improvement of the Sandy Hook entrance to New York Harbour, announces that the work of deepening Gedney's Channel is practically completed, it being 1,000ft. wide and 30ft. deep or more—generally 31ft. to 35ft.

The foundation-stone of a new parish church for Bishopstoke, Hants, was laid on Tuesday week. The first contract, which is exclusive of the tower, is for £4,000. The church will be in the style of English 14th-century Gothic. Externally, it is to be faced with snapped flints from the Reading chalk pits, the quoins and dressings being of Bath stone. Internally the walls are to be plastered over a brick face. The church is to have one aisle on the south side, vestries and organ chamber on the north side of the aisle. A square tower is intended to be built eventually at the west end of the nave. The dimensions of the nave will be 60ft. by 25ft.; chancel, 36ft. by 20ft.; aisle, 10ft. by 6ft. The tower is 21ft. square, its total height 58ft. outside, and 40ft. inside. Messrs. Wheeler Bros., of Reading, are the builders, and Mr. E. P. Warren, of London, the architect.

A NEW MULTIPLE HYDRANT FIRE-EXTINGUISHING APPARATUS.

THE objection to automatic fire-extinguishing apparatus is liability to damage from the water in parts of a building altogether untouched by fire—a serious item sometimes. The objection, of course, to ordinary hydrants is their inaccessibility in time of fire, placed as they often are in parts of the premises which it is impossible to reach when once the conflagration has obtained mastery. An invention just patented by Messrs. T. and I. Warbey, of 180, Southgate-road, N., seems likely to obviate both of these objections, and to prove of some service in the extinguishing of fires. The patentees claim the combination of a multiple hydrant with a system of perforated pipes, to supply water to one or more compartments respectively for the purposes of extinguishing fires, substantially as shown in the sketch.



A supply pipe from the mains or any reservoir of water is laid on to a multiple hydrant with branches, A. A. A. A., out from the main pipe B, and from each of these separate pipes a service of water, C. C. C., may be taken to any particular floor of the building, and the pipes that are laid in the floor or ceiling, D. D. D. D., are perforated so that when the water is turned on by the key E to such floor by that division of the multiple hydrant that controls it, then the water flows out of the perforated pipes, and will extinguish any fire in that floor or compartment. A valve is fitted to each division of the multiple hydrant, and also one is fixed in the main supply pipe; a small tap, F, is also fixed to draw off any water that may be contained in the multiple hydrant or the pipes beyond. In the case of a public hall the multiple hydrant may be fixed in a police-station or other suitable spot. The system is also applicable to ships.

THE NEW MUNICIPAL BUILDINGS, YORK.

THE foundation stone of the New Municipal Buildings at York was laid in the presence of an august assembly on the 18th of this month by the Right Honourable Joseph Agar, J.P., Lord Mayor, attended by the Corporation in State.

The new buildings, which have been designed by Mr. E. G. Mawbey, A.M.I.C.E., city surveyor, and now borough engineer and city surveyor of Leicester, will be situated adjoining the present Guildhall.

The style adopted is Perpendicular Gothic, the walls of the river front and the north elevation are to be built with Tadcaster stone, and the roofs covered with green Westmoreland slates, all to harmonise as far as possible with the existing ancient buildings. The principal entrance to the new block will be from the Guildhall, under one of the large windows at the north-west corner of that building, leading into a spacious vestibule from which rises a grand staircase built of Corsham Down stone, with rouge royal marble coping, &c., and steps of polished hard Yorkshire stone. There is also a supplementary working staircase at the north end of the building. The rooms on the ground floor consist of admirable suites of offices for the town clerk and the city surveyor, and also a large committee room. The grand staircase is continued down to the lowest story or basement, which is about 15ft. above the summer level of the river Ouse. From this staircase is a corridor leading to a large balcony on the river side in the front of the buildings on a level with the basement floor, and from this balcony a flight of stairs leads down to the present landing-stage at the bottom of Common Hall-lane.

On the basement floor are situated the principal lavatories, which are to be fitted up with all the latest improvements, sample and plan rooms, strong rooms for the town clerk and city accountant, the heating-chamber, and capacious store-rooms. The walls of this story are to be faced with glazed brickwork of various tints. On the first or principal floor is the council-chamber, a magnificent room, fronting on to the river, 50ft. long by 33ft. wide, the height being about 28ft. This room has four stone mullioned and traceried windows, each about 13ft. high by 7ft. wide, and a finely-timbered Gothic arched oak roof, with moulded transverse and longitudinal ribs, the ceiling being formed into richly-decorated panels, with carved bosses at the intersections. Surrounding the room is a handsome moulded and panelled oak dado 6ft. 6in. high, and the walls are further enriched with a carved oak cornice. On the east side is a massive moulded and carved oak mantelpiece, with panel for suitable inscription at the completion of the building. The floor is of polished oak.

On the same floor are also retiring-rooms for the Lord Mayor and Corporation and ante-rooms, and suitable lavatory accommodation is provided. At the east side of the Council Chamber are the offices of the city accountant. Living-rooms are provided above these for the caretaker.

The floors throughout are fireproof, being formed of rolled iron joists and Portland cement concrete. The system of lighting is not yet decided upon both gas and electricity are being considered at the present time. It is possible that the council-chamber, committee-rooms, and corridors will be lighted by electricity. An excellent scheme for lighting by gas has, however, been submitted by the York Gas Company, and has found much favour.

The heating is by hot water.

The system of drainage has been very carefully designed, special attention having been paid to the means of disconnection, ventilation, and inspection.

The cost of the building will probably be about £12,000, exclusive of land.

The contractors for the works are Messrs. Lowe and Son, Burton-on-Trent, and the clerk of works is Mr. William English.

THE NEW THEATRE ROYAL, EXETER.

THE Theatre Royal Exeter, the scene of the sad disaster of 1887, has been rebuilt on what is known as the "Irving safety plan," being the first theatre constructed on this design. The site is an unusually advantageous one for such a building, situated at the junctions of Longbrooke-street and New North-road, having open spaces on three sides. Longbrooke-street, which is made use of for the principal entrances, has a natural declivity, corresponding as nearly as possible to fall of the pit levels. The main entrance to foyer faces London Inn-square, from which point the building extends 186ft. by 66ft. in width. Internally, the auditorium consists of two levels only, the chief of which is the "circle," containing ten tiers, soldly constructed of concrete, supported by heavy cantilever girders. Two columns only support the circle, so that the view from amphitheatre beneath is very slightly obstructed. The wings of circle are carried on iron ornamental wall brackets without joists, built in. The fireproof front is of a graceful horseshoe shape. Between boxes, and extending 12ft. in front of proscenium-wall, is an archivolt, springing off either side of boxes, with richly-moulded and plaster panels and ribs. The ground level of auditorium contains the orchestra stalls, pit, and amphitheatre, which takes the place of a gallery. Separate exits have been provided for each part of the house.

The main features of this theatre are that the amphitheatre takes the place of the gallery, which is entirely dispensed with. All steps, landings, floors, roofs, &c., are made fireproof, and no person is seated above the proscenium opening; in fact, the highest point of the house is only 7ft. above the roadway. A large dome, 37ft. by 25ft. is the main feature of the plaster-panelled ceiling of auditorium. The auditorium and stage-roofs, boxes, &c., are constructed of a new fireproof material. Two tiers of well-appointed dressing-rooms are arranged on the Longbrooke-street side, the ceilings and floors of which are of fireproof material. The spaces between the numerous exits have been utilised for three shops. Inside the proscenium wall the stage, which measures 50ft. by 40ft., is cut off from auditorium by a fireproof curtain, which descends in twenty seconds. The height of stage-roof above the floor of stage cellar is 76ft., and a smoke-shaft about 12ft. square, with open glass louvres, is fixed in the centre of this roof. The flies are constructed of iron girders and fireproof floors. A commodious and well-lighted paint-room is planned at back of stage on fly level, with glass roof and concrete floor, and iron trap-door for paint-frame. Outside paint-room and flies, escape is made possible by a clear run into the open down a 4ft. wide staircase. On the "O P." side is one of Hayward's spiral staircases for same purpose. Hydrants have been placed in the flies, and at various and convenient parts of the building. The exterior has been improved by an iron escape portico to main entrance. The front mansard roofs have been covered with green Buttermere slate, the centre turret surmounted with iron coronæ, and the side roofs with suitable crestings in hammered iron.

The reconstruction has been planned by Messrs. Darbyshire and Smith, architects, of Manchester, and has been carried out in the short space of six months by Mr. W. Dart, contractor, Crediton, Mr. W. E. Dixon being clerk of works. Mr. W. J. Dart has acted as general manager of the works throughout their progress. The cost has been about £6,500.

CHIPS.

A Liberal Club is in course of erection at Sale, near Manchester, from plans by Mr. Robert McBeath, of Sale. It is half-timbered in character, and occupies a site at the corner of two streets; the assembly hall, on the first floor, is 42ft. by 21ft., and will be seated for 150 persons. Mr. J. Pennington, of Bowden, has taken the contract for erection at about £1,700.

The City Commissioners of Sewers met on Monday to consider a report recommending the provisional acceptance of tenders from three companies for supplying the City with electric light. The committee recommended the division of the City into three districts, to be let to as many companies at a minimum rate of £26 per arc lamp per annum; 395 arc lamps would be employed to light the main thoroughfares at a cost of £10,024, in place of 1,730 gas lamps, now costing £5,530 per annum. It was stated by several members that improvements were being made which would considerably reduce the cost of electric lighting, and the subject was referred back to the committee for further consideration.

The session of the Surveyors' Institution will be inaugurated on Monday, November 11th, when the President, Mr. Elias P. Squarey, will deliver an address.

The memorial-stone of a new grammar school at Bedford was laid on Friday. The large number of boys, at present 810, in the grammar school has made it necessary to abandon the existing site on the banks of the Ouse in favour of one in the playfield near the new park. The new school will accommodate 1,000 boys, and the cost will be £26,000. Mr. E. C. Robins, of London, is the architect.

The new vicarage at Whalley, Lancashire, has been carried out and completed under the direction of Mr. Henry Ross, of Accrington. The fragments from the adjoining abbey buildings discovered when pulling down the old vicarage, consisting mostly of portions of window tracery, have been carefully preserved. The only feature about the old house worth retaining—viz., the oak staircase—has been refixed in the new building. The work has been carried out by local contractors.

Building Intelligence.

Clumber.—The dedication of the new church was performed on Tuesday by the Bishop of Southwell. The church is cruciform on plan, consisting of a nave, without side aisles, choir of four bays with a chapel on the south, short transepts, and central tower. In style the fabric is of strictly English Gothic of the 14th century. Externally the walls are of the white stone of the neighbourhood, taken from the former chapel, the dressings being of red stone, whilst internally the whole is of red stone. The altar and reredos are of a white alabaster, the former being carved with the central subject of the Nativity, while adoring angels fill the side compartments. The church has cost about £40,000.

Dundee.—The work of redecorating and rearranging the Dundee Town Hall is now almost completed. For a long time the hall retained the beautiful appearance intended by Adam, the architect; but many years ago it was altered, and inferior decoration was adopted, and the renovation which has now taken place has restored the hall to its former beauty. The town council intrusted the work of renovation to Mr. Alexander, the city architect. The six windows of the hall have been filled in with stained glass. The windows are arranged in chronological order, and include those prominent characters connected with the history and development of Dundee.

Great Harwood, Blackburn.—A Congregational church was opened on Thursday week. The church is built upon the site of one that had been used for many years, and is situate in Queen-street. It is built of Yorkshire pierpoints with ashlar dressings, the style being Early English. The plan comprises an open spacious nave, entered through two porches, chancel, choir, and minister's vestries, lavatory, &c. At the east end is a wide vestibule with stairs to the gallery over. The seats are open benches of pitch-pine, and the roof is formed with hammer-beams and laminated rafters, with spars boarded on the top. Under the chancel is the heating-vault. The porch and vestibule floors are laid with Minton, Hollins, and Co.'s tiles, and the aisles and chancel with wood blocks, laid by the Wood Block Flooring Company, London. The design was selected in a limited competition, and the works have been carried out by Messrs. Fecitt, mason, Blackburn; Birtwistle, joiner; Hartley, plumber; Shackleton, plasterer, Harwood; Stanworth, slater, Burnley; and Gregg, carver, Darwen; under the direction of the architect, Mr. William S. Varley, F.R.I.B.A., Blackburn.

Hammersmith.—On Saturday last the Ven. Dr. Hessey, Archdeacon of Middlesex, dedicated the noble tower of the large and handsome parish church of St. Paul, Hammersmith. The building was commenced in 1882, and by the recent erection of the tower the fabric is now completed, and forms one of the largest modern parish churches in the diocese, having a length of 183ft. and a breadth of 67ft. 6in. The structure throughout is of red Mansfield stone externally, and Ancaster rag internally, both from the Lindley quarries. The arcades, which are richly moulded, are of blue Bath stone, supported on clustered columns of polished Belgian marble, the inside walls being lined to a height of 6ft. with the same material. The dwarf screen to the chancel is of Leopold marble from the Luxembourg district, and the steps in the sanctuary and in the morning chapel are of Devonshire marble from Messrs. J. and E. Goad's quarries. Accommodation is provided for 1,300 worshippers. The seating of nave and choir is of teak. The tower is a lofty and imposing structure, measuring 128ft. in height from ground line to top of parapet, and 159ft. to top of pinnacles which surmount its octangular buttresses; above these rises from the centre of the roof a pitch-pine flag-staff, having a total height of 80ft. This was supplied by Messsrs. Batchelar and Co., of Hammersmith, and carries a flag 24ft. by 12ft. A very complete system of lightning conductors for the protection of the entire building is being provided. The whole of the works, which have involved an expenditure of about £23,000, have been carried out, under the immediate supervision of the architect, Mr. Hugh Roumieu Gough, of 12, Carlton Chambers, by Messrs. Chamberlin Bros., of Hammersmith. Mr. Robert Pepperell has proved himself a valuable foreman, especially in the erection of the tower, which has been built "overhand," without the use of external scaffolding.

London County Council.—At a meeting of this body on Tuesday, the report of the Asylums Committee was brought up recommending that the tender of Messrs. W. Brass and Son, for the execution of the works for the extension of Canehill Asylum, for the sum of £79,763, be accepted. Mr. John Burns protested against the tender of Messrs. Brass being accepted on the ground that they were paying 1d. and 1½d. less wages than other firms of contractors. They had, it was alleged, "sweated" their men to the tune of 25 per cent., and they were offering a low rate of wage. During the past fortnight they had further reduced their scale of wages, and, at the present moment, the Government were making complaints against them for sub-contracting their work. He was prepared, if challenged, to prove all that he had stated, by the aid of blue-books and reports which contained the statements of the First Commissioner of Works on the subject. The firm in question were paying their bricklayers 7d. instead of 9d. an hour; and their painters 7d. instead of 8d. and 8½d. per hour; in fact, they were paying less than trade union wages. He moved that the matter be referred back to the committee to enable them to consider the tenders of other firms. Mr. Alderman Barker seconded the amendment, which was adopted. The tender of Mr. E. Gabbutt (Liverpool) for the execution of the work of erecting the superstructure of the asylum of Claybury, for the sum of £337,945, was also recommended by the committee for approval. Mr. H. Marks wished to know why the tender of a Liverpool firm had been accepted, when a London firm had tendered at a lower figure. Captain Probyn pointed out that the tenders received included seven or eight London firms. Mr. John Burns protested strongly against provincial labour being invoked when work could be done better and cheaper in London. Mr. Marks argued that when a tender had been accepted which was nearly £2,000 more than that offered by another firm it was time that some inquiry should be made, and some explanation given. Mr. Æneas Smith moved that the matter should be referred back to the committee, with instructions to apply for fresh tenders for the work. Mr. Marsland seconded the amendment. Mr. Martineau said the rejection of the committee's recommendation meant delay, and would also entail extra and heavy expense on the ratepayers. The amendment was rejected by 74 to 24. Colonel Hughes moved that the report be sent back, as two London firms had been passed over, both of whom estimated at lower sums than the firm recommended. The estimates were:—Pattinson, £335,975; Brass, £337,777; and Gabbutt, £337,945. Mr. Westcott seconded the amendmend, which was lost by 36 to 39. The council approved the recommendation of the Main Drainage Committee, that they should apply for powers to provide for the periodical inspection and repairs, if necessary, of drains under houses, by vestries or districts boards, and for the inspection and testing of house drains. The Highways Committee was authorised to prepare a bill giving the council power to deal with overhead wires. Messrs. Wm. Brass and Son, write to the *Times*:—"With reference to the remarks reported in your issue as having been made at the meeting of the London County Council, and which are prejudicial to our reputation, we beg to say that the member by whom such remarks were made must have been either misinformed or not aware of the actual facts. We do not think it necessary now to deal with the various matters *seriatim*, as we are writing fully on the subject to the Asylums Committee of the London County Council, and have offered them every facility for investigating the charges which have been made against us by the examination of our pay-sheets, &c."

Tunbridge Wells.—St. Peter's Church was reopened on Saturday, after enlargement by the addition of a north aisle and other alterations, carried out at a cost of over £2,000. The architects were Messrs. H. H. and E. Cronk, of Tunbridge Wells, and the contractor was Mr. J. Jarvis, of Grove Hill-road, in the same town. The work is in harmony with the original design of the church. Outside the building is of sandstone with Portland dressings, and tiled roof with Gothic three-light windows. In the interior the roof is of open timber and plaster. The pews match the older seats; the new aisle is paved with encaustic tiles of corresponding pattern. The new aisle is thrown into the church by an arcade of five sandstone arches, supported by columns of polished Aberdeen granite with carved capitals. The new aisle is 70ft. long and 23ft. wide, and affords accommodation for about 240 additional persons. The window at the east end of the church has been filled with stained glass of geometrical design. The whole of the church has been redecorated and various structural repairs and minor improvements carried out. The warming arrangements have been reorganised and augmented. The opportunity has also been taken to have the organ considerably enlarged at the hands of the original makers of the instrument in 1876, Messrs. Bevington, of Soho, London.

Union Chapel, Islington.—The completion of the building was celebrated on Monday last by a meeting, at which the Lord Mayor presided. The total cost of the structure, including the chapel with its tower, the lecture hall, the schools, infant schools, classrooms, vestries, and caretaker's house, has been £30,500. Other expenses, including the cost of the site, the furniture of the schools, &c., the organ, the purchase of adjoining property, and law and other professional expenses, have amounted to nearly £20,000 more. The tower, now completed, forms the western arm of the cruciform plan, and, opening by a wide arch into the chapel, contains nearly 250 sittings. Externally it is carried up to a height of 166ft., and finished with four gables, a staircase turret, and a central flèche. The architect is Mr. James Cubitt, the builders are Messrs. L. H. and R. Roberts, of Islington, and the carving is by Messrs. Earp, Son, and Hobbs.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Bradford Historical and Antiquarian Society.—On Tuesday, the 15th inst., the annual meeting of the above society took place in the Royal Hotel, Darley-street, when about a hundred ladies and gentlemen were present. After tea the chair was taken by the president, Mr. T. T. Empsall. The report was read by the secretary, Mr. J. A. Clapham, which stated that the society was in a highly flourishing condition, having nearly 200 members, and a balance of £57 2s. 6d. in hand, besides some thousands of copies of the *Bradford Antiquary*, the publication of the society. Mr. Wm. Glossop, the treasurer, read the financial statement. The report was adopted, and thanks given to the retiring officers, in which Messrs. Arthur Briggs, J.P., H. Muff, John Sowden, Butler, Wood, and Wm. Cudworth took part. Then an illuminated address and photographic album were presented to Mr. J. A. Clapham, the hon. cor. sec., by the president. Mr. Wm. Thackray and Mr. John Lister, M.A., of Shibden, Hull, highly eulogised the services of Mr. Clapham in promoting the interests of the society. The testimonial was suitably acknowledged, and a vote of thanks to the chairman closed the proceedings. The Bradford Arion Quartette Party sang some glees and songs.—The following is the programme for session 1889-90:—Monday, Nov. 11, Mr. Geo. Hepworth, "Our Excursions"; Dec. 6, Mr. T. T. Empsall (President), "Bradford in the latter half of the Seventeenth Century"; Jan. 17, 1890, Mr. Wm. Scruton, "Some Fragments of Bradford Histtory"; Feb. 14, Mr. John Lister, M.A., "The Pilgrimage of Grace and its local adherents"; March 14, Mr. J. N. Dickons, "Old Newspapers"; April 11, Mr. William Claridge, M.A., "Some Bradford Charities"; Sept. 12, Nomination of Officers; Oct. 10, Annual Meeting. The excursions for 1890 will be as follows:—May, Hellifield Peel; cicerone, Mr. John Lister, M.A. June, Collingham Church, Bardsey Church and Hall, and Saxon Crosses; paper by Mr. C. A. Federer. July, Holker Hall and Cartmell Church; paper by Mr. Robert J. Whitwell, of Kendall. July, Aldborough and Borobridge; Mr. Alex. D. H. Leadman, F.S.A., cicerone. Aug. 4 (Bank Holiday), Whitby Abbey; Mr. G. W. Waddington, cicerone. Sept., Woodsome Hall and Almondbury Church; paper by Mr. T. T. Empsall.

Manchester Architectural Association.—The fifteenth session of this association was inaugurated on Tuesday evening by a conversazione given by the president (Mr. J. H. Woodhouse) and committee at the Manchester

Athenæum. The annual report of the committee just published shows that the Association now numbers more members than at any previous period. A net increase of 11 is recorded for last session, and there is a total membership of 84, eight of whom are honorary members. During last session papers were read by the president (Mr. A. H. Davies-Colley), and Messrs. J. Corbett, H. B. Bare, F. Bennett Smith, J. A. Gotch, A. Standring, and J. D. Mould. The Association petitioned Parliament in favour of the Architects' Registration Bill. The following is the programme for next session:—Meetings, 1889: Nov. 5, President's Address; Nov. 19, paper by Mr. F. M. Simpson (London), "Old House Work"; Dec. 3, paper by Mr. W. H. Bidlake, M.A. (Birmingham), "Dry Rot; a Botanical Contribution to Architecture"; Dec. 17, paper by Mr. F. B. Smith, "A Visit to Doulton's Pottery Works"; Jan. 7, 1890, paper by Mr. L. Booth, F.R.I.B.A., "Commission"; Jan. 21, paper by Mr. F. R. L. Edwards, "Prospective; a 30th-Century Architect"; Feb. 4, paper by Mr. J. A. Gotch, F.R.I.B.A. (Kettering), "The Homes of Queen Elizabeth's Courtiers"; Feb. 18, paper by Mr. F. R. Farrow, A.R.I.B.A. (London), "The Ventilation of Public Buildings"; March 4, paper by Mr. T. Chadwick, A.R.I.B.A., and two others, "A Few Recent Notes in Holland and Belgium"; March 18, paper by Mr. W. E. Potts, A.R.I.B.A. Election of officers.

York Architectural Association. — The annual meeting of the above was held at the Church Institute on Thursday week, when the following officers were re-elected—viz., Mr. W. G. Penty, F.R.I.B.A., as president; Messrs. G. Benson, A.R.I.B.A., and W. C. H. Channon (Gibson and Channon), Malton, as vice-presidents; Mr. Norman R. Yeomans as hon. treasurer; Mr. Wm. Hepper (Fisher and Hepper), as hon. sec. and librarian; committee, Messrs. J. A. Braithwaite, A. B. Burleigh, T. R. Dickenson, R. A. Parkin, T. Monkman; past-presidents (ex-officio), Messrs. W. G. Penty, Arthur Pollard, and Wm. Hepper. The treasurer's report shows a balance of £25 in favour of the association, and it was announced that the committee have determined to expend a portion of this sum in books for the library especially adapted to students preparing for the R.I.B.A. examinations. Mr. Hall (Hall and Tugwell), Scarborough, was elected a Fellow, and Mr. J. W. Penty an Associate of the association. The usual votes of thanks were passed to the officers for their services during the past year.

COMPETITIONS.

Ayr.—In the competition for the Burns statue, of bronze, to be erected in the square opposite the railway station at Ayr, twelve models were sent in, and have been on view during the past fortnight. Mr. Hamo Thorneycroft, R.A., was appointed assessor, and has awarded the first premium to the figure by Mr. Geo. A. Lawson, of London, and the second to that by Mr. Mossman, of Glasgow. In Mr. Lawson's model the poet in this figure is standing on his left foot, with the right slightly advanced. He is attired in the costume of the small Nasmyth picture in the Scottish National Gallery, save that a pair of shoes, buttoned at the side, are substituted for the sporting top-boots—viz., swallow-tail coat with high collar, vest open at the neck, and soft necktie; while the head has affinities to the Nasmyth portrait, and to the Flaxman statue now in the National Portrait Gallery at Edinburgh. The arms are disposed across the body, the right taking an angle which carries the hand up nearly to the left lappel of the coat, while the left arm is placed below it at the waist. The design by Mr. Mossman is of a more homely character than that of Mr. Lawson's. The face is thoughtful. Burns, who is wearing a frock-coat, is standing by the trunk of a tree, and rests his left hand, in which is a book, upon it; while in the right hand, drawn up breast high, is a pencil. The competitors were Messrs. M'Gillivray and Kellock-Brown, Glasgow; Messrs. W. G. Stevenson, A.R.S.A.; John Rhind (two models), Birnie Rhind, J. S. Rhind, C. Macbride, G. Webster, Edinburgh; and Mr. Williamson, Esher.

North Kensington Free Library.— The *Kensington News* says: — "The scheme for adapting Nos. 108, Ladbroke-grove, and 101, Lancaster-road, for the North Kensington Public Library, has resulted in failure, the designs recently submitted in competition having shown that the buildings are unsuitable for the purpose, and that the commissioners having decided to plan an entirely new building on the site, having invited the original competing architects to submit another set of designs. We are not surprised that several of them have declined the offer, on the ground that, having at great cost and labour gratuitously supplied data on which the present judgment of the commissioners has been formed, it is scarcely fair to ask them to supply additional information at a cost which would further increase the loss of the unsuccessful, and reduce the profit of the winners to less than a half. This would certainly seem to be taxing the generosity of the architectural profession a little too far, especially so if we are rightly informed that this is the third competition which the commissioners have initiated."

Scarborough.—The first tentative step towards the laying out of the Mere Valley, the property of the corporation of Scarborough, were taken in the summer of last year, when it was decided to solicit plans, designs, and estimates for the work, comprising gardens, pleasure-grounds, and sites for detached villa residences. The scheme also contemplated the enlargement of the Mere itself to something like its former extent, and so that it should, with a comparatively shallow depth, be both available for boating and fishing in summer, and skating in winter. Conditions were given out with the invitations to compete, stating that the plans should be made to include refreshment-rooms, conservatories, boat-houses, &c., as well as residences. Prizes of £150 and £50 were offered for the first and second best plans, respectively. Eleven plans, with, in some cases, accompanying drawings and descriptive details, were received by the Corporate Property Committee, and have been on view to the members of the Town Council, at the Town Hall; and their characteristics have been fully reported upon by the borough surveyor to the Town Council. On Tuesday week, a committee unanimously selected two, one bearing the motto "Progress" and the other that of "Floreat Scardeburg" as first and second. The next in excellence were those marked "Recreation" and "Scardeburg" respectively. The first-prize plan is the production of Messrs. Edeson and Rowntree, architects, Scarborough, and the second prize is awarded to Mr. R. Upcher, of Penzance. The estimate of cost for "Progress" is £26,800, and of "Floreat Scardeburg," £25,031.

The Proposed "Eiffel Tower" for London.—The directors of the proposed London Tower Company, of which Sir Edward Watkin is chairman, have decided to offer two prizes of 500 guineas and 250 guineas for the best designs for a tower. The prizes will be open to competitors from all countries. Sir F. Bramwell and Mr. Benjamin Baker, civil engineers, and Mr. T. A. Walker, contractor, have agreed to act as a committee to adjudge the prizes. The tower will be 1,250ft. high.

Mr. T. S. McCallum, C.E., of Chapel-walks, Manchester, was on Oct. 9th appointed engineer (in succession to the late Mr. R. Vawser, M.Inst.C.E.) for carrying out the main sewerage works of the local board district of Royton, near Oldham.

The restoration of Llandow Church, near Cowbridge, Glamorgan, has now been commenced. The church will be fitted with new seats, prayer-desk, lectern, chancel-seat, and altar-table, all of oak; also a stone pulpit. The work is being carried out under the direction of Messrs. Kempson and Fowler, architects, Llandaff, Mr. John Morgan, of Llantrissant, being the contractor.

The parish church of St. Thomas, Birmingham, has just had some important additions made to its chancel fittings by the introduction of a pulpit, presented by the children of the late Nathaniel Lea, for several years churchwarden of the parish, in memory of their parents. New reading-desks and a brass eagle lectern have also been provided, and were used for the first time when the pulpit was dedicated. These works, as well as others of a minor nature, were effected, under the superintendence of the architects, Messrs. Osborn and Reading, of Birmingham, by Messrs. Jones and Willis, of Birmingham and London.

A stained-glass window, representing "Christ Blessing the Children," has been placed in St. Paul's Church, Birmingham, as a memorial of the late vicar. The artists were Messrs. Hardman and Co., of Newhall-hill, Birmingham.

Engineering Notes.

Dalmarnock.—The ceremony of laying the foundation-stone of the new bridge about to be built over the Clyde at Dalmarnock took place on Friday week in the presence of representatives from the Corporation of Glasgow, the Burgh of Rutherglen, and the Lower and Middle Wards of Lanark, all of which bear a share in the cost of the erection. The bridge will be the third that has spanned the river at this particular spot since 1821. The present structure will consist of five spans, 54ft. 8in. each in width, resting on masonry piers and abutments. The piers are of ashlar founded on iron caissons sunk by the pneumatic method—the same as employed in connection with the Forth Bridge—through a depth of 55ft. of muddy clay and sand to the solid rock. They are finished with a granite impost from Ben Cruachan Quarry. The superstructure consists of steel girders, cross girders, and buckled plates. The outer girders will have a facia, and will be topped with a cast-iron parapet. Between the parapets the width is 50ft., being 32ft. for roadway and 9ft. on either side for pavements. The bridge will be strong enough to bear the heaviest description of loads. Its cost is estimated at nearly £30,000, as compared with £3,182 and £2,966, the respective costs of its two predecessors. Messrs. Crouch and Hogg, C.E., Glasgow, were the designers of the bridge, and the erection is being carried out by Mr. A. H. Boyle, contractor, Bonnybridge, for whom Messrs. Jardine and Co., Motherwell, are making the steel and iron work.

West Highland Railway.—The ceremony of cutting the first sod of the West Highland Railway in an important section of the line near Fort William, was performed on Wednesday, by General Lord Abinger. This new line, authorised after a keen contest in the last session of Parliament, will continue the North British Railway from Helmsburgh to Fort William, a distance of 100 miles, passing through one of the most beautiful parts of Scotland—viz., by the side of Loch Long, Loch Lomond, by Glenfalloch, Loch Tulla, and over Rannock Moor into the Spean Valley, near the entrance to Glen Rey, thence on to Fort William. There will also be a branch to Crinan, 40 miles in length, by way of Loch Heck, Inverary, and Loch Fyne, thus giving an improved connection with Loch Awe. The engineers for the works are Messrs. Forman and M'Call, of Glasgow, and the contractors Messrs. Lucas and Aird, of Westminster.

CHIPS.

Some important additions to the defences of Plymouth are now being made which will, it is imagined by the authorities, add to the safety of that port. Several new batteries are in course of construction at Bovisand, Tregantle, Maker, and Whitsand Bay. Of these, the last named, the largest, will be completed in about three years. The magazines and accommodation for the gunners will be built near the respective batteries, in the construction of which no stone is used, but only bricks and cement.

Messrs. D. Macandrew and Co., Lock-street, Aberdeen, have been informed by the Prison Commissioners that their offer for building the new prison at Craiginches has been accepted. The site occupies four acres, and the prison has to be finished and ready for occupation by the 21st May, 1891. The building will cost £30,000.

The town council of Brighton have elected Mr. F. J. C. May, now borough surveyor of Maidstone, as borough surveyor.

St. Mary's R.C. Church, Carmarthen, was re-opened after restoration, decoration, and improvements by the bishop, the Right Rev. John Cuthbert Hedley, on the 17th inst. The new R.C. Church of St. Michael, Wareham, Dorset, will be opened on the 19th prox. The new R.C. church, St. Joseph's Retreat, Highgate, London, will be opened by Archbishop Scarisbrick, Right Rev. Bishop Hedley, and Right Rev. Bishop Patterson, on November 21. This is the memorial church of Leo XIII. The architect for the above three churches is Mr. Albert Vicars, Somerset Chambers, 151, Strand, London.

A portrait, by Mr. Herkomer, A.R.A., has been presented to Sir John Dorington, M.P., at Gloucester, in recognition of his services as chairman of the Gloucestershire magistrates, and as chairman of the first County Council. The portrait will be placed at the Judges' Lodgings with those of previous county chairmen.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

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Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

C. H. (We should try Boyle's chimney cowls. We have known them answer in apparently hopeless cases. There seems nothing faulty with the construction of the flues.)

RECEIVED.—M. R. Co.—H. A. G.—H. H.—W. Co.—W. B.—C. I. Co.—F. M. and Co.—Senor P.—C. of G.—G. E. and Co

Correspondence.

THE MORALITIES OF COMPETITIONS.

To the Editor of the BUILDING NEWS.

SIR,—About two years since a competition was instituted by public advertisement, of designs for an endowed school at West Hartlepool, in which a considerable number of gentlemen took part in the effusive way common to the profession. The result of that competition was, that the competitors were informed (not with an excess of courtesy) or left to discover for themselves, that not one of the designs submitted was good enough. A local practitioner was called in, and the task of meeting the views of the Trust was committed to him. Even this drastic course was allowed at the time to pass in silence—architects cannot afford to demand, much less try to enforce, justice in these days! But, with cynical audacity, the fruit of the labours of the Trust and their architect is published in your issue of the 11th inst. It must excite boundless astonishment and indignation in the minds of those who confided in the wisdom and rectitude of the Trust—for the plan is commonplace even to extinction; it has no single feature of originality or of power. The elevations are stiff, formal, graceless. All this, however, might pass as the punishment of the Trust and the misfortune of the public for whom they act, but for other facts upon which I wish to ask your opinion and that of your readers, especially those amongst the latter who took part in the competition. These are the facts, namely:

The ground was exceedingly contracted for the purposes of the school, and also of an impracticable shape. The accommodation demanded paid no heed to any such restrictions, or to the limited amount of the funds in hand. Your readers know the style in such cases—"the plan must include everything, the building must be handsome; but it must not cost much." At West Hartlepool amongst other requirements there was a head master's house; now a gentleman of this class cannot be satisfactorily lodged in a house of less than nine or ten rooms, and as the money to be spent was but (I quote my memory only) about £4,000, this house formed a very prominent item of expenditure, besides occupying a large portion of the space. This was the problem: to pack a large school, with classrooms, &c., and a gentleman's house on a queer little triangular piece of ground, for a very small sum. The Trust decided that the competitors had one and all failed to do it, so their work was cast back to them without thanks. Well, how do the trust and their inspired architect succeed? The plan which you published shows that they omitted the house entirely, and no statement is made as to the actual expenditure; as to the former point, the Gordian knot is cut, as to the latter, no doubt similar liberties have been taken. Is this a just and righteous transaction? Is it one to which any honorable man ought to have lent his name or have taken any part in? Is there no remedy?—I am, &c.,

22 Oct. A VICTIM.

ACCRINGTON CONSERVATIVE CLUB COMPETITION.

SIR,—Your last issue's illustration of the proposed Conservative Club, Accrington, reminds me of the peculiar conditions supplied. A limited number of architects were asked, three of whom were willing and did compete, viz., Messrs. Morley and Woodhouse (the successful competitors), Mr. Dickson, Manchester, and Mr. Ross, of Accrington (*the latter gentleman an A.R.I.B.A.*)

The objectionable clause is practically as follows: The building shall cost not more than £8,000, and that the architect shall be paid the lump sum of £250, or £300 if the building shall be completed for £7,000. This amount included for the *quantity surveying* as well as all the other services generally rendered by an architect, the committee paying the clerk of works. After a deduction of, say, only 2 per cent. is made for quantities, the architect's commission will amount to a little over 1 per cent., allowing the cost of the building at £8,000, which amount in all probability will be exceeded.

The above is a practically correct statement; but even allowing the "*lump sum*" to be £50 more, how far indeed is it below a decent clerk's salary during the erection of the building?

I need not wind up my letter by asking, Can these things honestly and conscientiously exist? Does it not lead to unsound workmanship, careless details, and corruption generally, &c. ?—for such questions will at once introduce themselves along with the facts.—I am, &c.,

LANCASHIRE.

ST. ALBAN'S ABBEY.

SIR,—In the "B. N." for Sept. 6th I informed its numerous readers that the person who, under the *nom de plume* of "Ars," had, for some six or seven months previously, amused himself by libelling the fair fame of the living and the dead in these columns, was a W. H. M. Ellis, M.A., Cantab., living at 1, Trafalgar-terrace, Monkstown, Dublin; but I pointed out that, although *nominally* the father of those letters upon St. Alban's Abbey, he had really no intimate knowledge of the place, and so his utterances might be taken for precisely what they were worth.

In your issue for Sept. 13th, W. H. M. Ellis, M.A., Cantab. ("Ars"), writing from his Dublin suburb, and referring to St. Alban's, said:—

"I am going there in a few days, and shall carefully scan the old and new work, including his ["H. H.'s"] statuary. . . . I hope I shall also find (though not for Mr. Hems' sake) that the rumour I mentioned to him *is* untrue."

In the issue for October 18th he appears to have paid the promised visit, with the result that, instead of honestly confessing himself from beginning to end utterly in the wrong, he tries—very clumsily—to wriggle out of the libel suit that possibly hangs over him by declaring (this is the man, by the way, who accuses others of "falsehood") that, until the present correspondence arose, he had never heard of the existence of my son. In fact, although professing to know all about St. Alban's Abbey, he declares he has never heard of one who, almost continuously, since the first day in 1884 until last month, to use the kindly words of the Ven. Archdeacon Lawrence, of St. Alban's (quoted in "B. N.," Sept. 13th), "has had a very trying position to occupy in the Abbey, and has always behaved himself exceedingly well in it."

W. H. M. Ellis's, M.A., Cantab. ("Ars") affected ignorance on this part is altogether *too* transparent! He knows he has libelled the young man in the "B. N.," and by private letter; but no impudent and bare denials can now shield him from the natural consequences.

The rest of his letter, relative to St. Alban's, is almost too contemptible to refer to. After writing—at the dictation of interested parties—all sorts of absurdities relative to the place for over half a year, he at length pays a brief personal visit, and then has absolutely nothing to say to the point. He certainly rambles about Barford in Salop, Beverley, Worcester, Doncaster, and of "Blomfield's big church at Portsea," and then whines altogether irrelevant things about Messrs. Aston Webb, Earp, Brindley, Rattee, Pearson, and the Dean of Winchester, all (the last six) most excellent gentlemen, but not one of them with anything to do with St. Alban's.

The various items, all nine of which W. H. M. Ellis, M.A., Cantab. ("Ars"), with his usual good taste (?), dubs as "absolutely false," I know positively to be altogether true; and the one relative to a man, said to be called Tabron, who, with a lawyer-like looking person, scaled the hoarding and scaffolding of the high altar screen during the dinner-hour on 14th March, 1889, and who were detected by my son, are facts that will—if necessary—certainly be sworn to by the latter at the coming trial of Gibbs v. Grimthorpe.

The best advice W. H. M. Ellis, M.A., Cantab. ("Ars"), of 1, Trafalgar-terrace, Monkstown, Dublin, can take is to carefully think over what he has written, and then withdraw and apologise for the mistakes he has made. It will be the cheapest, as well as the most graceful, way out of the mess he has got himself into. If he does so at once, I promise to accept it.—I am, &c.,

Exeter. HARRY HEMS.

ERRATUM.—In Mr. W. H. M. Ellis's letter on St. Alban's Abbey last week, on p. 544, third line from bottom, "he" is misprinted for "M.," which makes the paragraph refer to the wrong person.

CHIPS.

The Corporation of Cheltenham have called in Messrs. Bailey Denton, Son, and North, of Palace-chambers, Westminster, to advise on the measures to be taken to prevented the flooding of basements in the neighbourhood of the promenade of the town from the sewers in times of heavy storms.

Mr. T. S. McCallum, E.C., of Chapel Walks, Manchester, was on Oct. 15th appointed engineer (in succession to the late Mr. R. Vawser, M.Inst.C.E.) to complete the Slackbrook sewerage and purification works for the local board of Swinton and Pendlebury, near Manchester.

A statue of the Queen is shortly to be erected at Oodeypore, and unveiled by Prince Albert Victor during his visit to the Maharaja Futteh Singh, of Oodeypore, who intrusted the commission to Mr. C. B. Birch, A.R.A. The statue is of Carrara marble, and represents her Majesty in regal attire, holding the sceptre in her right hand and the orb in the left hand. The figure is about 9ft. high, and is placed upon a pedestal of Classic design, which bears a raised bronze panel containing an inscription.

Professor Herkomer has just completed a three-quarter length portrait of Mr. William Cawkwell, deputy chairman of the London and North-Western Railway Company. The directors have acquired it for the board-room at Euston Station, where the picture is to be placed.

On Sunday last, the new marble and alabaster reredos was unveiled in the parish church of St. James's at Elmstead, near Wye, Kent. The reredos is of veined alabaster moulded, carved, and highly polished. It is in the 13th-century style, and has been designed by Mr. E. Lyne Parsons, architect, of Exeter. The super-altar is a slab of Ipplepen marble, polished. The reredos proper is divided into three compartments, the central one being the largest and highest. The middle arch is cinquefoiled and cusped, and contains a calvary cross on three steps, all in pure white statuary marble. The background is of Rosso Antiquo marble. Mr. Harry Hems, of Exeter, carried out the work.

Intercommunication.

QUESTIONS.

[10127.]—**Old Oak.**—Would someone kindly inform me as to the best manner of darkening new oak to represent old? I have tried staining with the ordinary fluid staining mixtures, but the process requires so many applications, thereby saturating the timber.—Oak.

[10128.]—**Technological Examination.**—Having been a candidate in the City and Guilds Examination of of May, 1889, I venture to ask the opinion of your numerous readers on the following question given in the examination paper on Carpentry and Joinery:—Give a plan and section of a scale ½ to the foot of a dog-legged staircase 3ft. wide in a hall 7ft. wide, height of story 11ft. from floor to floor, with a landing at a distance of 8ft. from the floor. Show newels, and line of handrail. Would this be a dog-legged staircase? I think it would be an open newel staircase. If so, why should such a question be given?—F. J. O., New Cross.

[10129.]—**Spire.**—Could any kind reader inform me of the correct method of drawing an entasis to a spire? I wish to apply it to a broached spire 62ft. high, and octagonal, rising from a square tower 19ft. square.—Inquirer.

[10130.]—**Decayed Stone.**—A building front of coursed hammer-dressed local sandstone, has about one-sixth of its separate stone perished to a depth of ⅛in. to ¾in., with other parts in patches slightly perished. Which is the best mode of restoration? To replace the old facing with new would be both costly and weakening; reworking old stone in this locality facilitates decay. Is there any known composition that would arrest decay?—C. W.

REPLIES.

[10111.]—**Cast-Iron Pillars.**—Will "H. L." kindly quote Prof. Rankine's formula of, and remarks on the strength of a cast-iron stanchion of double-ribbed section or H-shape, with a rib also in the middle between outer flanges—G.

[10111.]—**Cast-Iron Stanchion.**—Gordon's formula is given as follows for a stanchion of + shape—

$$W = \frac{36s}{1 + \frac{3l^2}{400d^2}}$$

in which W = crushing weight in tons; s = sectional area in square inches; d = diameter over arms in inches; l = length in inches.—H.

[10111.]—**Cast-Iron Pillars.**—"H. L.'s" reply to my query is entirely beside the question, for I should not have asked it if Professor Rankine had gone into it; but he has not said anything at all about such a section for cast-iron, or even wrought-iron, struts. Such off-hand replies as those "H. L." offers induce people to spend their money uselessly. I had carefully gone over Rankine's formulæ and investigations before asking the question, and indeed, the lack of information in Rankine especially induced me to ask it.—Rex.

[10119.]—**Ordnance Datum.**—This is two-thirds between high and low water at Liverpool. Your correspondent will not get a better inexpensive book on land surveying than Baker's, to which he might, however, add Merrett's "Land and Engineering Surveying."—C. E.

[10119.]—**Ordnance Datum.**—The Ordnance Datum of this country is the approximate mean water at Liverpool; all levels marked upon the maps are the heights above this datum. Any depth can be assumed below a bench-mark as a datum, so long as it is below the lowest point of the ground. Read articles on "Levelling" that have been given in the Building News. "Levelling," by Thos. Holloway (Spon); Usil's "Practical Surveying" is also a sound handbook (Lockwood and Son.)—G. H. G.

[10121.]—**Main Sewer.**—If the street is a private one, the cost of laying the sewer will have to be borne by the owners, under the 150th Section of the Public Health Act, 1875; but if a public highway, it will be the duty of the Sanitary Authority to bear the expense of so doing.—H. S. C.

[10125.]—**Earthworks.**—In reply to "Doubtful,' I have had great experience in measuring earthworks such as described. The labour to forming slopes at a given angle, whether in excavation or forming earthwork mounds, is quite a different and extra item to general excavations. Forming internal or external angles is still more additional labour. If you measure the excavations and mouldings nett—say per yard cube—you must certainly add extra for labour per yard sup., for levelling off to and forming the slopes at the given angle, and also for intersections. Or you could allow extra measurements to that taken for sloping and forming angles, &c., as if the excavations had been taken out solid, which would be double.—Surveyor.

[10125.]—**Earthworks.**—"Doubtful" had better read some work on practical mensuration. Baker's "Land and Engineering Surveying" will give information how to measure embankments; or Alex. J. S. Graham's "Manual of Earthwork," or Broadbent's "Earthwork Tables" (Lockwood and Son). Of course, if measured nett, extra ought to be allowed for labour forming slopes and angles. The material excavated is a factor of the cost.—G.

The Clyde Navigation Trust accepted on Monday the resignation of Mr. George Beith, the manager, and granted him a retiring allowance of £1,000 per annum in recognition of his 26 years of service.

The Warwickshire County Council decided, on Monday, to carry out works of reconstruction of the drainage of the county lunatic asylum, in accordance with a report by Mr. Rogers Field, at an estimated cost of £3,300. The work will be carried out under the superintendence of a clerk of works, no contractor being employed.

Our Office Table.

The report of the Architectural Association just published in the "Brown Book" again records the completion of a prosperous session. The total number of members has increased from 1,052 at the end of last session to 1,094. Papers were read at the ordinary meetings by Messrs. J. A. Gotch, A. T. Walmisley, J. L. Robinson, W. Doubleday, F. E. Masey, F. G. Hooper, J. Slater, J. M. Bryden, J. T. Micklethwaite, A. B. Pite, Lacy W. Ridge, J. Starkie Gardner, and D. J. Blow. The work of the classes has been well up to the average, and on the whole the work has been better and more sustained than in former sessions. A new class, that for the elementary study of water-colour, has been carried through by Mr. W. Millard, and has turned out very good work. The concluding paragraph of the report states that a sub-committee has recently been appointed to consider whether any alterations in the methods and working of the Association would add to the development of its usefulness as an educational body in view of the extended requirements of professional education.

The twenty-first annual exhibition organised by the Worshipful Company of Turners, opened on Wednesday in the Ball-room at the Mansion House, is hardly up to the usual average. As in former years, the exhibition is divided into three sections—Wood, Glass, and Metal. In Wood, the judges were Mr. J. Holtzapffel (past master), Mr. H. W. Elphinstone, the Rev. S. B. Burnaby, and Mr. R. C. Rapier. They report that they see no improvement in the exhibits over those of former years; but possibly more attention may have been paid to "form," and this has been considered in the awards. Regret is expressed that the liberality of the Turners' Company is not more widely appreciated by the advent of a larger number of competitors. As to the work of apprentices, it cannot be very highly commended, much better work having been sent in on former occasions. The first prize in the Wood section, a silver medal and the freedom of the company, is taken by Mr. G. A. Alderton, of Brighton, for a pair of vases in kingwood and boxwood. Mr. W. A. Barber, of West London, secures the second prize, bronze medal and three guineas, for a pair of vases. The other winners in order of merit were — Mr. H. Gates, of South London (for a pair of balustrade rails), Mr. F. Nicholay, of West London (pair of vases in hard black wood), Mr. C. A. Priest, of East London (pair of vases), Mr. James Read, of North London (ornamental bracket), Mr. S. Thwaites, of Hastings, Mr. J. Lewington, of West London, and Mr. M. Tasker, of Liverpool. The premiated apprentices were F. Nicholay, of West London, A. Madden, of East London, E. Capell, of London, and R. Taylor, of Coventry. In the amateur class the first certificate of merit for ornamental wood in turning is taken by Mr. John Bedell, of Cheadle, Cheshire; and that for ornamental turning in ivory by the Rev. C. C. Ellison, of Bracebridge, Lincoln.

At the last meeting of the London School Board, an influential deputation of Metropolitan builders attended to present a memorial, which we published in our issue of the 11th inst., p. 505, having reference to the system of inviting tenders for the erection of new schools or enlargement of the premises, and also to general repairs to or painting of schools. Mr. Lawrence Stevens, L.C.C., who headed the deputation, said they thought the present system was unfair to them. They complained that, after working for the Board for many years, at one fell swoop the whole of them had been deprived of the work, which had been given to larger builders. If some of them had not done the work satisfactorily, it had been open to the committee to choose other local men. The present deputation wished the principle to be established that the local men should have the local work. He asked the Board to revert to the old system of giving them the small repairs, whilst leaving the larger undertakings open to competition. In reply to questions from members, the deputation said they objected to the giving of the contracts to a select few. On the motion of Mr. Cook, the memorial was referred to a special committee to consider what action the Board should be recommended to take in the matter.

A series of marine parks have just been constructed at South Shields, at a cost of £22,000, inclusive of boundary walls and railings, band stand, refreshment houses, shelters, and terraces, from plans by, and under the direction of, Mr. Matthew Hall, the borough engineer. The effect of these works and other improvements carried out by the corporation has been to convert the town into one of the most populous seaside resorts on the north-east coast, and the North-Eastern Railway Co. have added it to their "Tourist" list. A correspondent, who has lately visited the mouth of the Tyne, writes us that the town has a great future before it as a watering-place, and that there seems to be an excellent opening for a good family hotel of from 60 to 70 bedrooms near the parks.

Mr. J. J. Hissey, of Eastbourne, cautions those possessing valuable water-colour paintings against placing electric lamps in close proximity to their pictures. His three years' experience of the electric (incandescent) light has shown that so placed the new illuminant is sufficiently powerful to cause some of the more delicate pigments to fade to a greater or lesser degree. Water colours that are safe in diffused daylight are not, he points out, always so when exposed night after night, for many hours, to the active white light of electricity close at hand.

A meeting was held at the Merchant Venturers' School, Bristol, under the presidency of the High Sheriff (Mr. G. D. Pope), for the purpose of discussing the registration system of the Worshipful Company of Plumbers. The chairman strongly supported the movement, remarking that in the protection of health a really good plumber stood second only to a really good doctor. A well-advised system of education, such as with the help of the Plumbers' Company, would be offered within the walls of that school, was calculated to reduce to a minimum those blunders which arose from ignorance. A system of registration would be the means of getting rid of, as far as possible, careless and reckless persons who would be a disgrace to any trade, and it would put a stamp upon a man, indicating that he at any rate possessed a certain amount of knowledge and skill. Mr. Meachin, a past master of the company, having given a sketch of its history, it was decided, on the motion of Mr. S. Pope, seconded by Mr. Gough, and supported by Dr. Davies, medical officer of health, to form a district council for Bristol and the West of England, and an equal number of masters and operatives were afterwards elected to form such council.

A public meeting was held in the Philosophical Hall at Leeds on Friday, under the auspices of the Company of Plumbers, for the purpose of distributing registration certificates to masters and operative plumbers. Mr. J. Wreghitt Connon, F.R.I.B.A., who presided, urged Institute architects to specify that the laying of house-drains should be solely intrusted to registered plumbers, instead of being left to the least-skilled and worst-paid class of workman employed on a building—the ordinary labourer. Mr. T. Pridgin Teale, M.A., moved a resolution heartily approving the formation in Leeds of a district council in connection with the movement for the national registration of plumbers. The resolution was carried unanimously, and among subsequent speakers were Sir James Kitson and Mr. W. R. E. Coles, secretary to the Plumbers' Company.

MEETINGS FOR THE ENSUING WEEK.

Monday.—Royal Academy Lectures in "Anatomy," No. 7, by J. Marshall, F.R.S. 8 p.m.

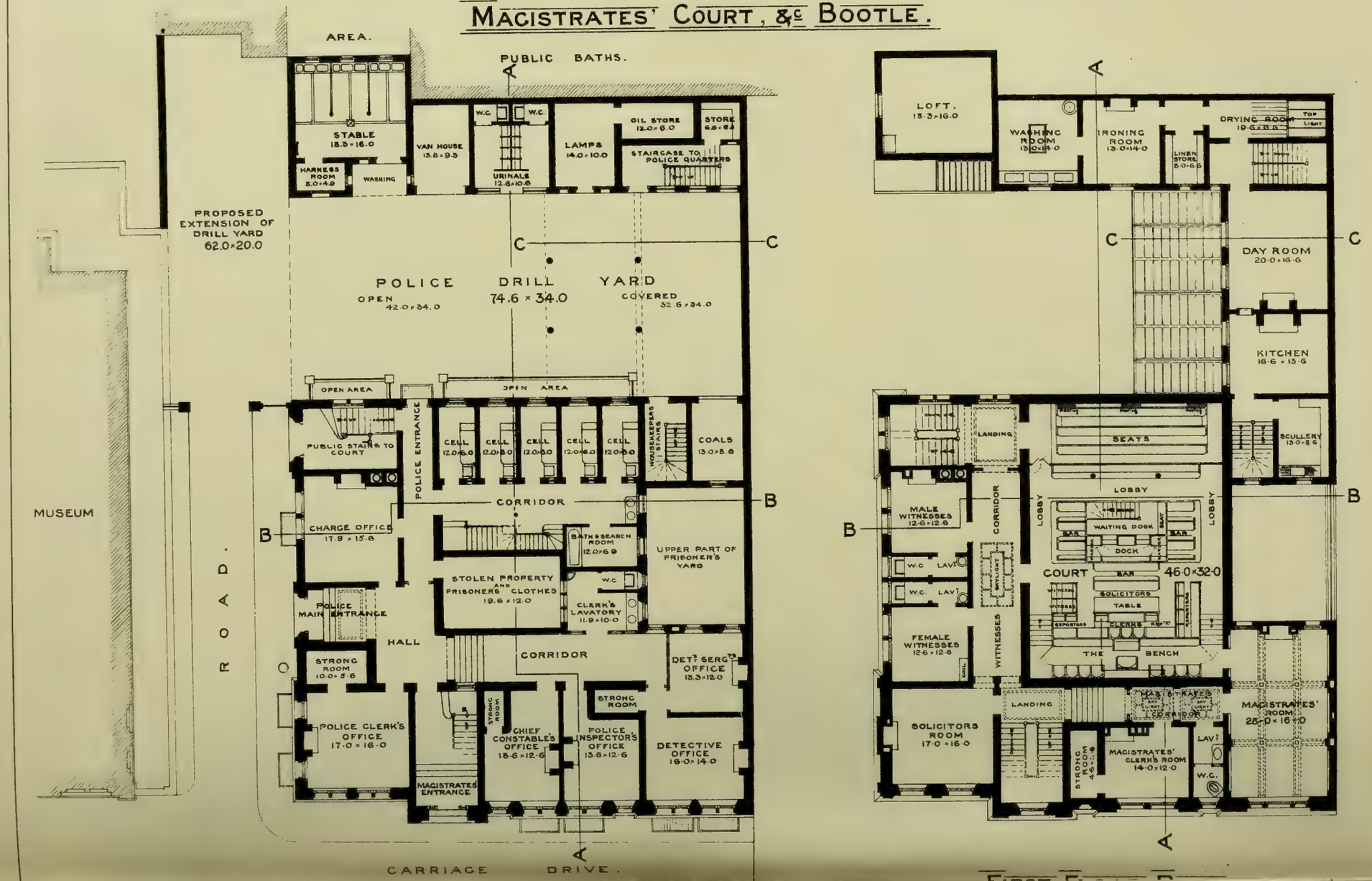
Tuesday.—University College, Gower-street. Free Lecture on "Applied Art," No. 3, by H. Stannus. 5 p.m.
Sanitary Institute, "Sale of Food and Drugs Act," by C. E. Cassal.

Friday.—Architectural Association. "Treatment of Angles and Enclosing Lines," by F. T. Baggallay. 7.30 p.m.
Royal Academy Lectures, "Anatomy," No. 8, by J. Marshall, F.R.S. 8 p.m.
Sanitary Institute, "Methods of Disinfecting," by Shirley F. Murphy.

Architectural Association, 9, Conduit-street, W.—The Second Ordinary Meeting will be held on November 1st, 7.30 p.m. Paper by F. T. Baggallay, Esq., on "The Treatment of Angles and Enclosing Lines."

Fred. R. Farrow } Hon. Secs.
Ernest S. Gale }

MAGISTRATES' COURT, &c BOOTLE.





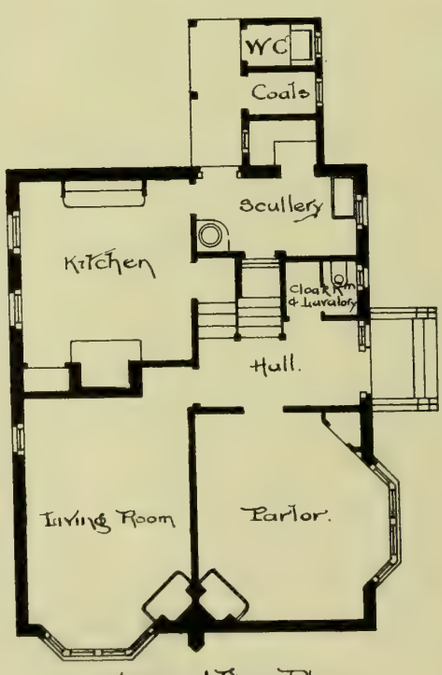
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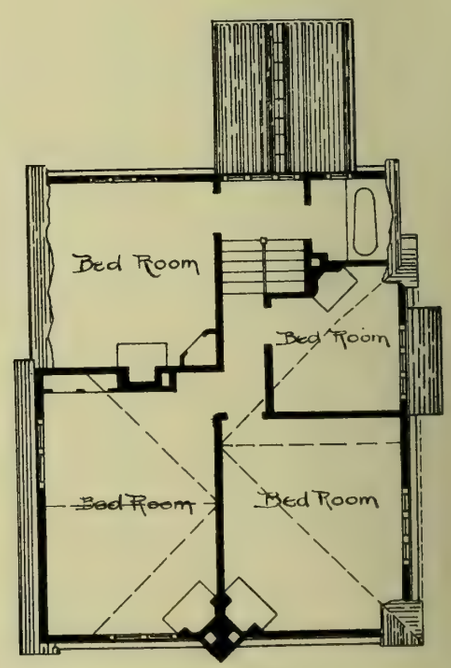
"Sunnicot," Benhilton.

for H. Evans Esq.





Ground Floor Plan



1st Floor Plan.



H.D. Appleton TRIBA
167 Wool exch.
E.C.

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NEW PASSENGER STATION FOR DUNDEE

ON THE CALEDONIAN RAILWAY

THOS : M : BARR - ENGINEER

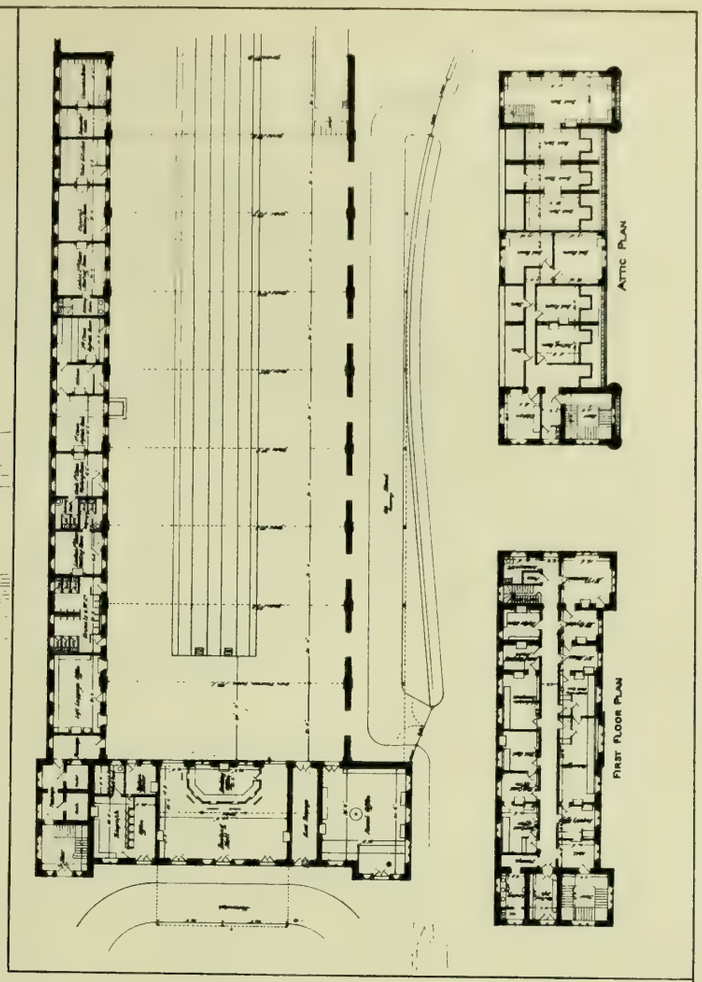
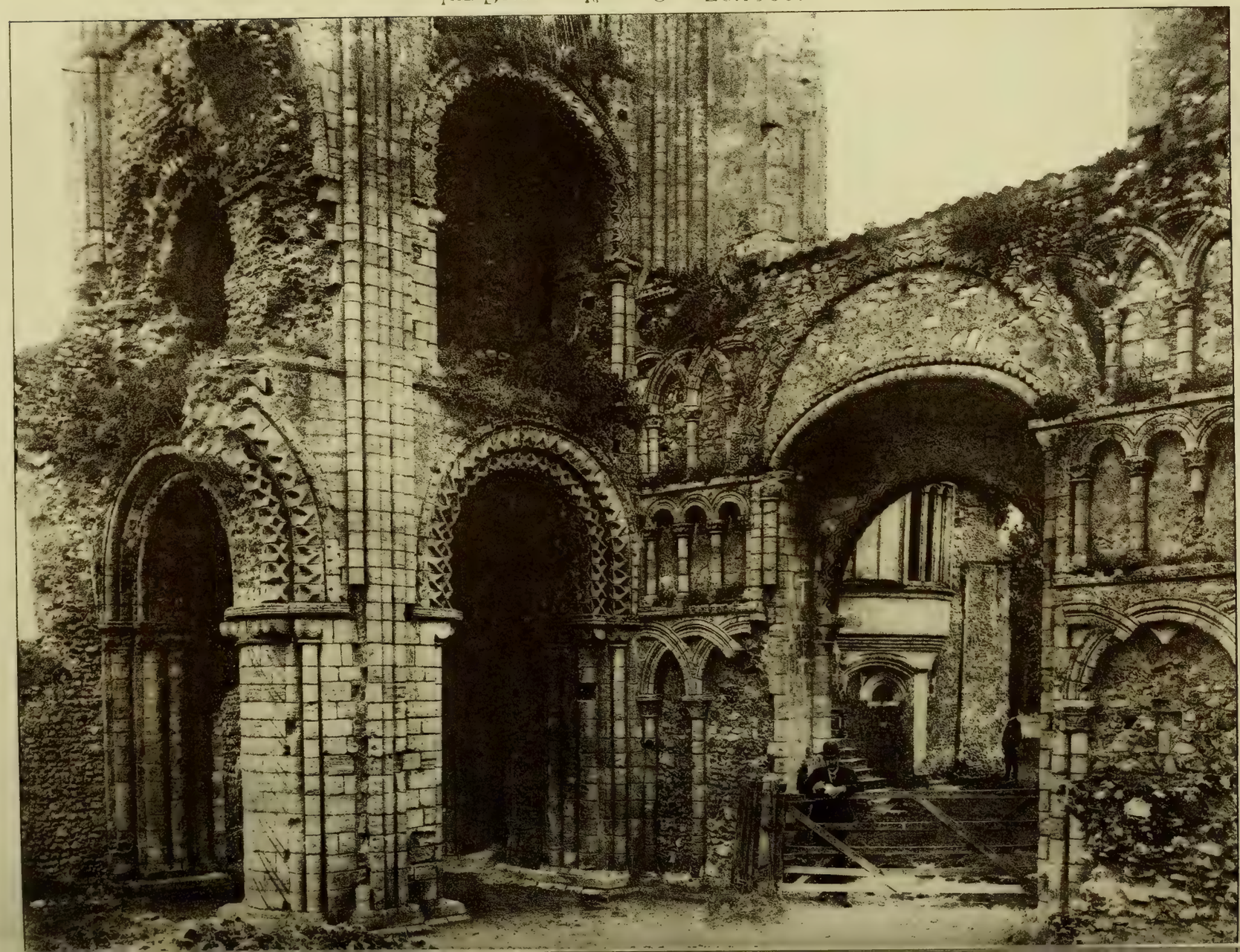
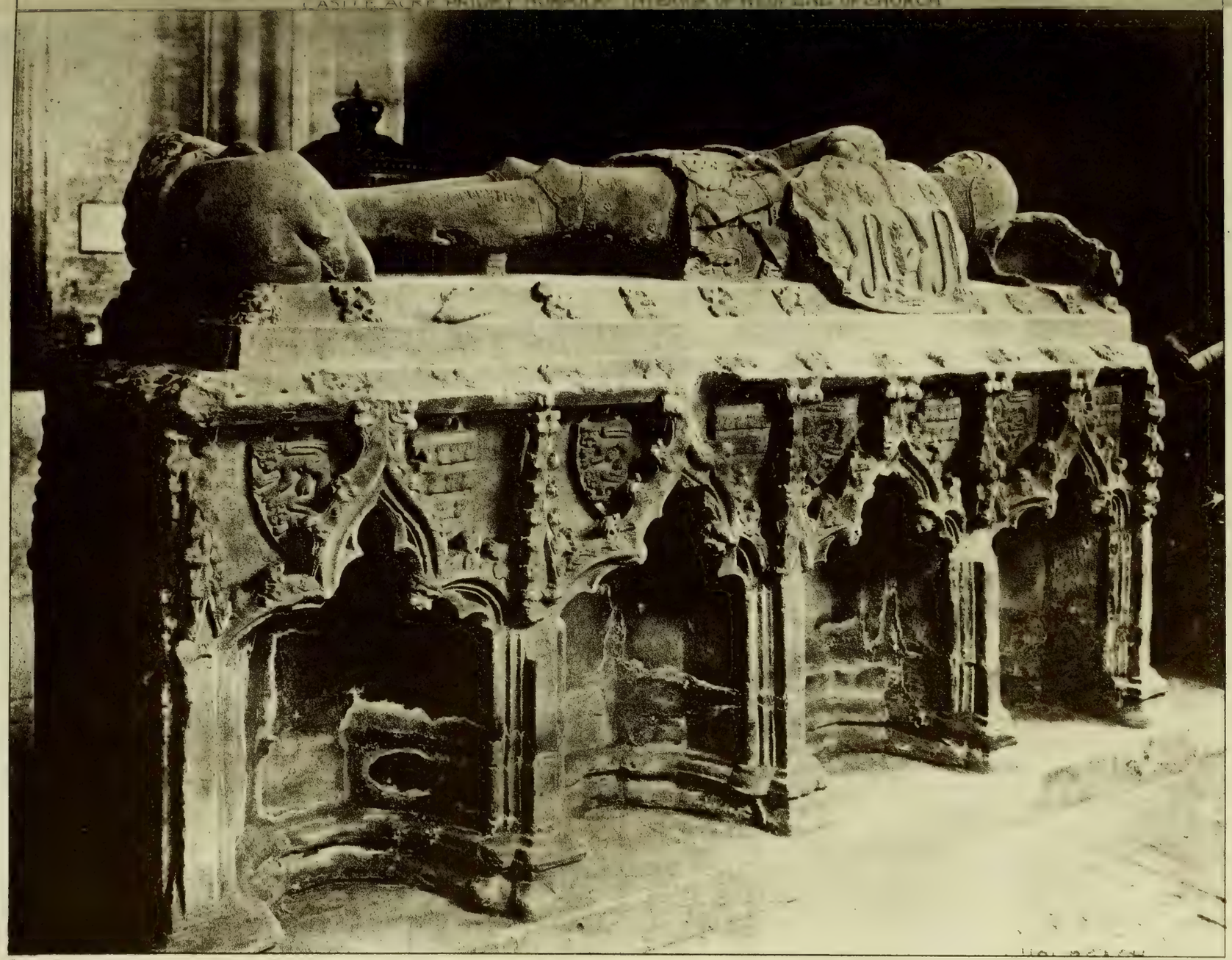


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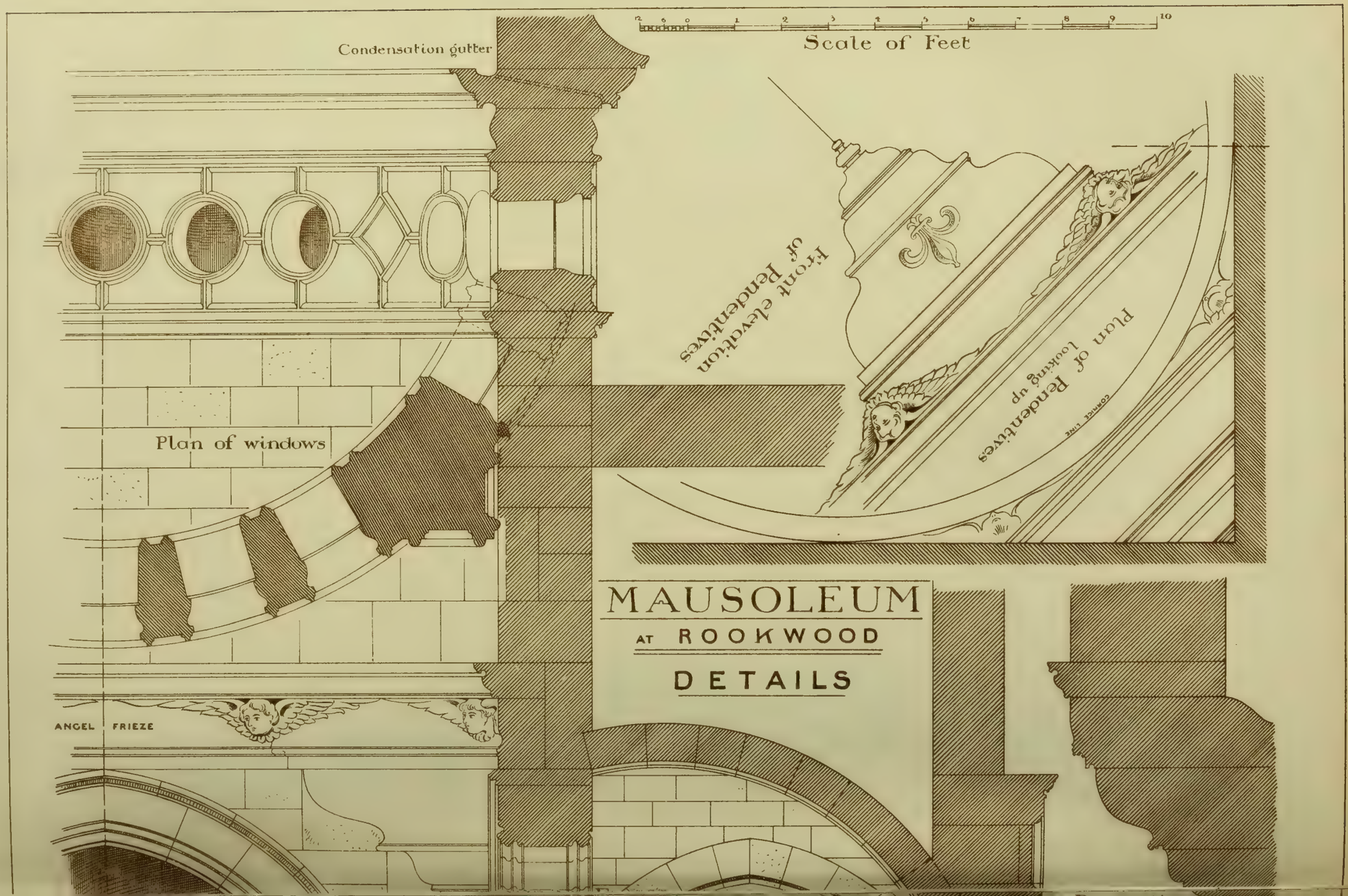




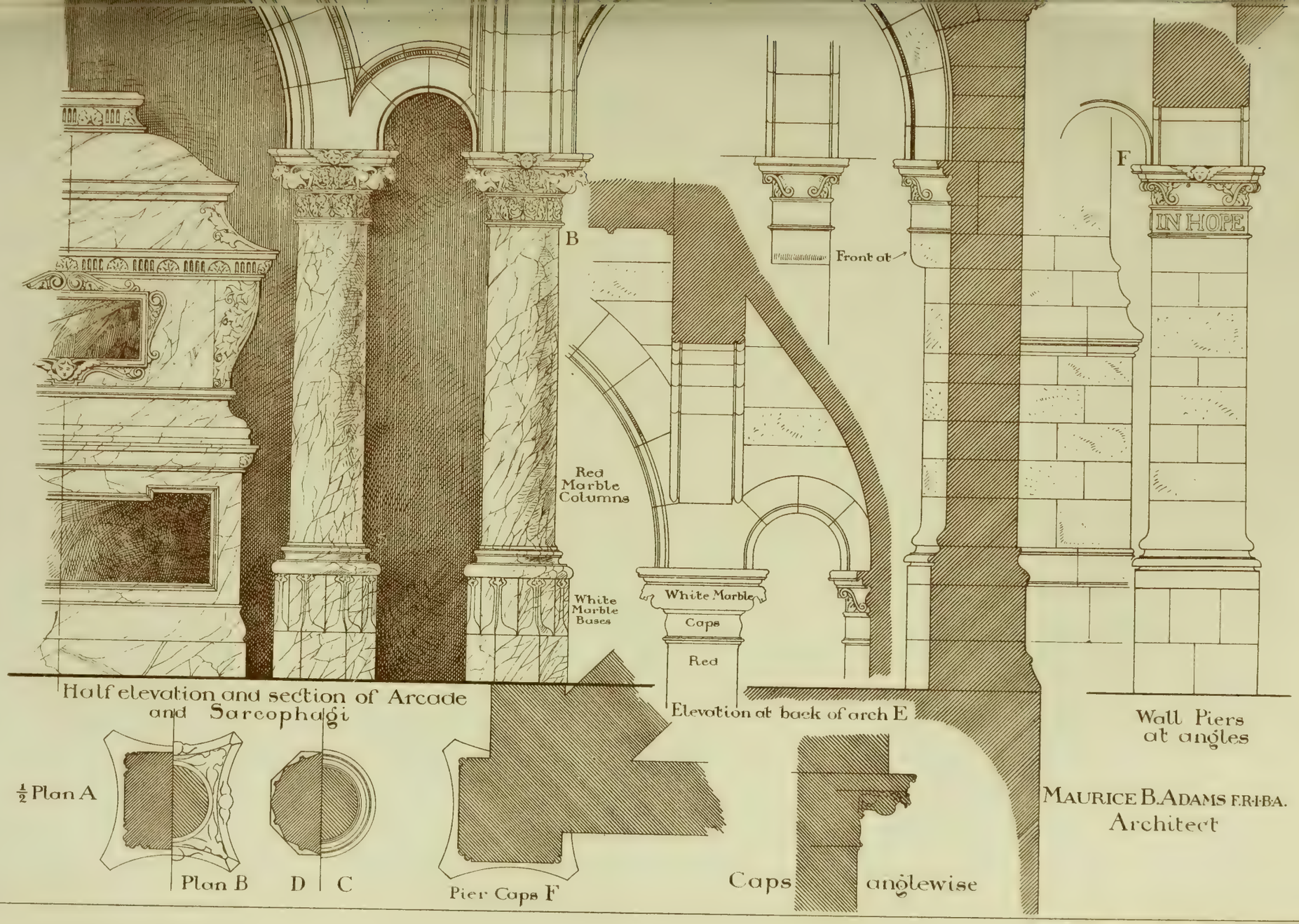
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TOMB OF SIR HUMPHREY LITTLEBURY · HOLBEACH · LINCOLNSHIRE



MAUSOLEUM
AT ROOKWOOD
DETAILS



Half elevation and section of Arcade and Sarcophagi

Elevation at back of arch E

Wall Piers at angles

½ Plan A

Plan B

D

C

Pier Caps F

Caps anglewise

MAURICE B. ADAMS F.R.I.B.A.
Architect

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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1317.
FRIDAY, NOVEMBER 1, 1889.

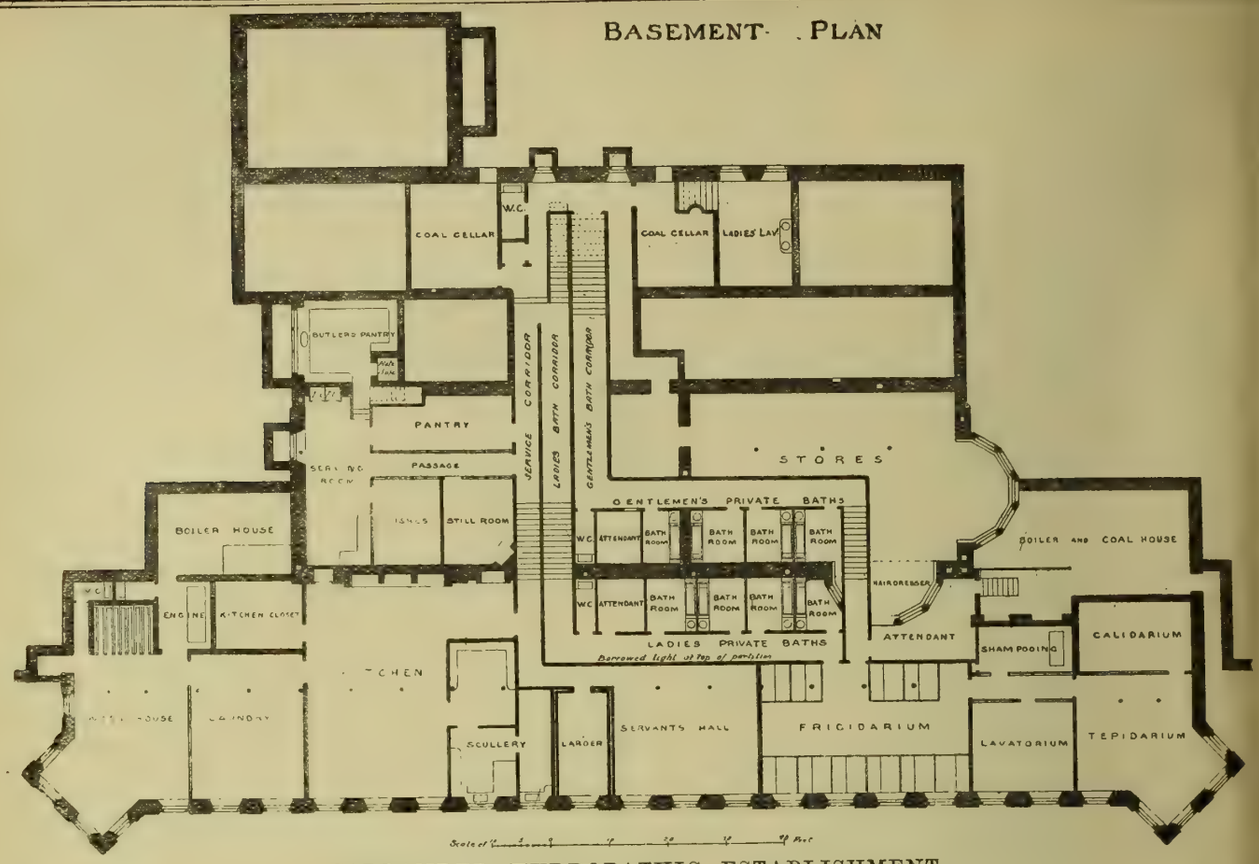
BUILDING REPAIRS.

ONE of the miscellaneous duties of the architect is to prepare specifications for repairs. No very definite meaning is conveyed in the term except that it is supposed to cover the various trades connected with building. The question is generally where to begin and where to leave off, and unless this question is clearly defined by the specification, a great deal of difficulty is likely to arise. We have known the general directions of the architect so uncertain as to these points, that the cost has varied from 50 to 70 per cent. The repairs may mean substantial restoration of the fabric, including walls and timber construction; or they may mean renovation of only particular parts that are essential to make the building wind and water tight, such as the repairs to roofs and gutters, decayed window-frames and sashes, replastering to damaged walls, repainting, and the like. The quantity surveyor, to whom is intrusted the measuring of the work, is apt to overstate the requirements, or to throw upon the builder the duty of finding out how much should be done to make a satisfactory result. To add to the difficulty of the situation, the old materials removed in the process of reparation have to be taken into account and credited. A good form of repairing specification is not commonly met with. The responsibility of finding out what has to be done is left to the contractor, who thereupon forms his own opinion of the extent of the labour and new material. The clauses are in general terms, often, owing to the impossibility of discovering the condition of certain parts of the building, superficially. In stone walling for instance, we find a general clause of this sort, "Cut out the decayed parts of facing and make good with new to match the old work." The quantities may contain the full dimensions of the entire area of facing, or only portions; the contractor uses his discretion in only cutting out the worst portions of the facing and making good. In short, the interpretation of the architect's intention is left to the contractor. Another item to walling may run, "So many yards superficial of removing plaster from the walls, and repairing the stonework with similar stone to the old, inserted in cement, pointing the joints with mortar," a clause that is frequently found in specifications for repairs to churches. When the architect's examination has not been very minute, we find a clause in this strain, "Examine windows, and where found necessary repair by cutting out decayed stones and inserting new, including removing saddle bars and glass and making good." We can scarcely imagine a more vague description of what has to be done—it amounts simply to instructing the contractor to do what he thinks desirable, and no more. The words "examine and repair" throw the entire responsibility on him, and unless he paid a visit to the building, and carefully noted the decayed stones and their position, it would be impossible for him to make an accurate estimate of the repairs necessary to a number of windows in a church. Properly the specification should refer to a drawing or elevation, however rough it may be, the windows being numbered or distinguished on the specification, and the stones that are decayed marked in dark colours in the drawing. In the repairs of towers a very uncertain quantity is left to the contractor, owing to the difficulty and inconvenience attending the survey and examination of the upper portions that are often not readily accessible. Many of these structures are imperfectly restored in consequence of the general directing clause, which instructs the builder to "examine and repair parapets, pinnacles, and buttresses of tower where necessary."

In restorations of this kind a plan of the tower or parapets ought to be made, as well as an elevation of each decayed side, and the parts to be cut away distinguished by colour. New windows and doorways ought to be also tinted and referred to in the specification and quantities as "cutting away to insert new window marked A on drawing, describing the thickness of wall, and dimensions of window, and making good, &c." The same general vagueness appears in specifications describing repairs to carpenters' and joiners' work, in plastering, painting, and general making good. These matters are entirely left to the specification, few drawings to assist the surveyor or builders are given, and the result is that there is a strong inducement to men of indifferent reputation to tender for works of this sort, as they know a wide margin is left for tendering. We have only to glance over the lists of tenders for repairs published to see the remarkable disparity there is between the amounts named. Certain instructions to builders who compete for works of this kind ought to be given. The builders' associations ought to make it compulsory that no member should contract who has not personally viewed the building, and carefully examined with the specification the items therein mentioned. This rule would quickly bring about a reform amongst architects. They would then be compelled to describe more fully the nature and extent of repairs to old buildings, to provide drawings of details, such as stonework and timberwork that are to be restored in part, and a better method would be followed in surveying buildings. We are aware of the difficulties sometimes met with in surveys of this description. For example, it is often very difficult to say how far a floor may be decayed without taking up the boards; how far an old roof truss is unsound, or a tie beam which is covered over at the ends or built in a thick wall. In such instances, where a minute examination cannot be made, no comprehensive specification can be written, and the only satisfactory alternative is to ask the builder to allow a price after a minute examination has been made; any extra labour or material that may be necessary being measured and valued at a fair schedule of price. In stonework the same mode of proceeding is often necessary, as the removal or cutting out of one part may necessitate an amount of extra labour and material that cannot be foreseen at an early stage of the work.

NINETEENTH CENTURY ART SOCIETY.

THE nineteenth autumn exhibition of this Society, which is largely made up of amateurs and young members, represents a good deal of earnest effort, and a few works by well-known artists, among a number of indifferent canvases. Yeend King has a pleasing and clearly-painted view, "Abingdon"; F. W. Hayes half a dozen subjects—landscape chiefly—in which the romantic element is strongly represented. "Wray Castle," Windermere (2), "Elterwater" (154), "A Farm" (176), "The Great Langdale," and "Lyn Dhu," Carnarvonshire (214), are a few of the subjects. The mountainous districts of North Wales and also of Westmoreland are favoured. Another well-known contributor is Arthur Dodd, who in "An Apparition" has given a very amusing incident of canine curiosity and porcine stolidity. An old boar, with its head out of his sty, is being stared at with remarkable wonderment by two dogs; the painting is as good as we look for from Mr. Dodd's pencil. "Forestalled" (231) and "Hide and Seek" (142) are other clever studies of animal life. Arthur L. Vernon has a pleasing figure subject in "Fortune Teller" (9); and we mark with approbation the work of Mr. R. S. Marriott, the secretary, whose coast views, "On the Severn near Pool Quay" and "Path across the Cliff, from Sandown to Shanklin, Isle of Wight" (17), and view at Broadstairs (111), are painted with an appreciation of colour and atmosphere. Arch. Webb, in 22, gives us a luminous effect on a river. In sea-painting this quality has found many admirers among painters of one school, and here the "Morning: Herne Bay," by Julie Frigout (230), and "A Silver Evening," by Louis Grier (232), are examples of luminous seas and skies under different aspects. As a study of *genre*, "Au Revoir," by C. Haigh Wood (29), is prettily composed: a village lane, with overhanging gabled houses, and a lady in the picturesquely simple dress of the 18th century, is bidding "good-bye" to some children at the gate. The drawing of figures is graceful, and the colour and handling delicate. "Matinée de Printemps" (43) is spoilt by the colour, the blue frocks of the girls with their white caps in an orchard of intense green; a spring morning, but rather too intense to render the delicacy of light and shade of springtime. The "Ripe Apples" of J. Fitz-Marshall, and the "Roses" of W. G. Sanders, are feelingly handled. Pups struggling at a platter of food, by Cecil C. Aldin, is a clever piece of dog painting. Some classical drawing and refined colouring are shown in Herbert Sidney's figure studies, "Pompeian Widow" and "Bride," but they lack naturalness and expression. Maria Brooks's "Just Talking it Over" (68) is painfully puppet like, the two figures of servants talking over their mistress's affairs in her drawing-room look like automata, though technical merit is not absent. Landscape finds skilful interpreters in A. Critchley-Salmonson, F. A. Verner, and Hamilton Marr. "Evening, Lymington" (53) is a pleasing sketch; there is softness though want of vigour in "A Fine Day in October" (58); Mr. Marr's delicately-executed work "On a Pass 'twixt Lake and Wood" (64) is idealised landscape, the light hazy and soft; whilst his other views of "Lydstep" (97), "Tenby" (189), and "A Grey Day" (134) are full of nice tone. Qualities of good workmanship meet us in G. A. Williams's "Wood Cart" (98), and in his feelingly-painted little landscape "Near Coombe Wood" (217); in the woodland view of R. J. Leigh (119): in S. J. Barnes's "First Snow on Loch-na-Gar" (131)—the latter a large canvas of wild mountain scenery. The bracken-covered foreground, with its brambles in rich brown, is well painted, and gives value to the landscape; but the work is not perfect—there is a hardness of transition between the foreground and middle distance, and a lack of atmosphere that does not indicate a snow-laden atmosphere. "Gleam, Storm, and Mist," by H. A. Seymour, is a clever suggestion of the varied conditions of sky and coast; and the moonrise effect of H. Maurice Page's "Laleham Ferry" (140), Peter MacNab's "Sea and Sky" (191), Kate Amphlett's "Surrey Common" (267), a clever bit of gorse and upland; Marmaduke A. Langdale's landscape (215), and Norman P. Davies's seascape "On a Lee Shore" (269), are worth attention. The terriers, in Hugh G. Shaw's "I Have a Song to Sing," are faithfully painted; Charles J. De Lacy paints with effect "A Tug and Barges Coming up the Thames" (76), the light and atmosphere well done; and we must notice some portraits—one of a naval officer (92), and another of a foreign-looking gentleman in a Spanish broad-brimmed hat and cloak—by H. J. Thaddeus, whose work is full of character. E. M. S. Scannell's "Sweet Childish Days,"



CALLANDER HYDROPATHIC ESTABLISHMENT.

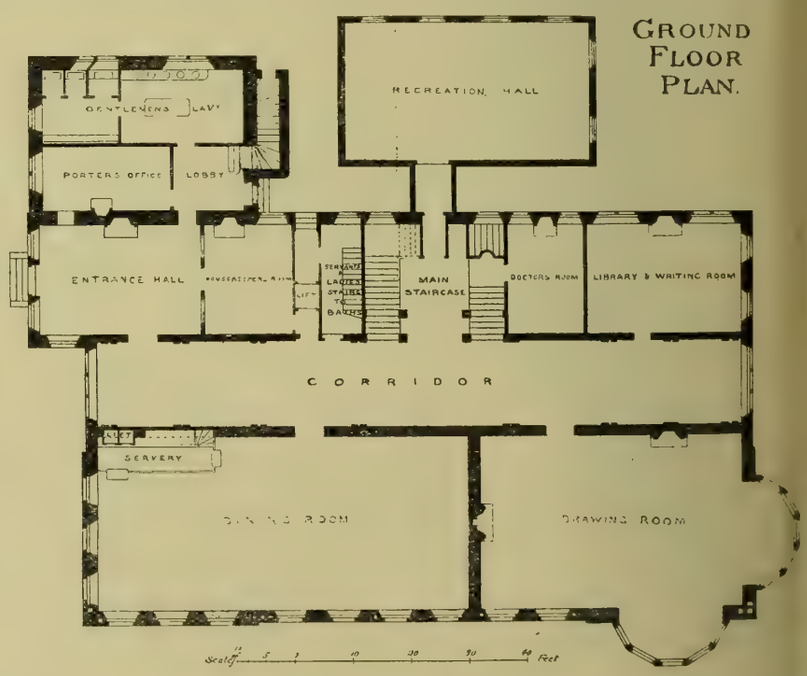
a large picture of girl and dog by the side of a bank, and a "Souvenir of the Last Century," by Edward Patry, a study of girl's head and bust (266); and works by G. Leon Little (248), J. FitzMarshall (216), and A. M. Wilson (255), are other pictures above the average, one of the least successful works being W. Luker's intensely green "'Twixt Shadow and Sunshine."

The Water-Colour Gallery contains a few good drawings. A charming simplicity with purity of colour mark James Loxham Browne's "Summer Fields" (278), "A Bit of Hampstead Heath" (290), "Carrying Hay" (366), the sketch "The Harrow View" (402), and other studies of open country, broadly handled. A. Canella's figure study (283), Thomas J. Soper's "View on the Thames" (284), some careful drawings by John Sowden, an old contributor (299, 342, 349); a forcibly-drawn subject, "Low Tide, Whitstable," by H. Maurice Page (303); a sketch by E. Brace, "Hampstead Heath" (376); some drawings by Edward Jennings, "Corner of Wych-street" (301), and "Honfleur Harbour" (422); "Cornish Cliffs," by Alfred Ficklin (322), who has other similar studies; W. Sidney Cooper's study of a cattle-yard at Padworth (362); works by J. Lawrence Hart (370), J. D. Barnett (379), and W. J. Boddy (380, 443); Powell May (444), A. Quinton (439), show some good handling, and nearly exhaust the best works. The amateur hand is strongly in force here as in the other part of the exhibition.

THE HYDROPATHIC ESTABLISHMENT AND ITS BATHS.—II.

By R. Owen Allsop, Architect.
Author of "The Turkish Bath: Its Design and Construction."

A USEFUL illustration of a large hydropathic is furnished by the establishment at Callander, the property of the Callander and Trossachs Hydropathic Company, Ltd. Through the courtesy of Mr. David Rattray, C.A., and Mr. James M. Monro, respectively the secretary and the architect to the Company, I am enabled herewith to give plans of this building. It comprises, as will be seen from the plans of basement and ground-floor, a main block, with two areas over ground-floor corridor for light and air to bedroom corridors; an addition or annex for the billiard-room, having bedrooms in floors above; and a recreation hall. The site sloping considerably, the basement is brought out on one side beyond the main block, thus accommodating the kitchen, &c., laundry, and baths. Entering by way of the main entrance hall, we find porter's office and housekeeper's room in convenient positions. The entrance hall leads into a main corridor, extending from end to end of the building. On one side of this corridor are placed the spacious dining-room and drawing-room, overlooking a terrace above



the baths, &c. On the opposite side is the main staircase, and a smaller staircase for servants and to allow ladies to gain access with privacy to the baths, and from any floor. On the same side of corridor are a library and writing-room, and a doctor's room off landing on stairs. By so raising the latter apartment, access is gained to a ladies

lavatory beneath. Next the secondary staircase is the luggage lift, continuing from basement to the topmost story. A lobby adjoining the entrance-hall allows of access to the gentlemen's lavatory, and a staircase to the billiard-room over. By way of the well of main staircase we arrive at the recreation-hall—an addition to the original building by Mr. Monro, who has made modifications throughout for the present company. The housekeeper's room is kept low, and thus, in the 18ft. height of ground-floor, a bedroom is arranged for her, accessible from the smaller staircase.

Running through the basement are three corridors for the purposes, respectively, of domestic service, to allow of access to ladies' baths, and to the gentlemen's baths. The secondary staircase, continued down, leads to the two former. The gentlemen's bath corridor is reached by a staircase from the well of main stairs. The service corridor conducts to the kitchen, scullery, larder, pantry, butler's pantry, &c., and to the servants' hall. In the portion of the basement adjoining the kitchen are wash-house, laundry, boiler-house, engine-room, and drying-room. On either side of a section of the side wall of main block are placed ordinary bath-rooms, rooms for attendants, and w.c.'s. In these eight bath-rooms are ordinary baths, wherein can be administered baths of various kinds, as may be required. The corridors of both ladies' and gentlemen's baths terminate in doors to the cooling-room of the Turkish bath, either of which may be locked, according as the bath is set apart for the use of ladies or gentlemen. Through an attendants' room access is gained to the heating apparatus, stokery, and boiler for the supply of hot water. The Turkish bath is compactly arranged. In the cooling-room are ten private couches and dressing-places. There is a spacious tepidarium, and a calidarium, lavatorium, and shampooing-room are conveniently arranged.

Above the ground-floor are first, second, and third bedroom floors, and a little additional accommodation in the Mansard roofs over two of the corners of main building and over the annex. On the first floor the stairs to floor above are placed about over the centre of the length of main corridor, and on either side of it are areas, with skylights at the bottom, lighting main corridor. On the first floor are two private sitting-rooms, with two bedrooms, bath, and w.c. attached to each. There are also seven single bedrooms, linen-room, housemaids' closets, and w.c.'s. On the second floor are two sitting-rooms, with two bedrooms each, and with baths and w.c.'s; two pairs of bedrooms, or bed and dressing-rooms combined; thirteen single bedrooms; and linen-room, housemaid's closet, and w.c.'s. Over billiard-room annexe are combined sitting-room and bedroom, and three single bedrooms and w.c. On the third bedroom floor are two pairs of bedrooms, and twenty-four single bedrooms, linen-room, housemaid's closet, and w.c.'s, as on floor under. Staircases are here contrived to the Mansard roofs, which each contain three bedrooms. This establishment is situate in the finest Loch district of Scotland, and is capable of accommodating over one hundred visitors.

(To be continued.)

LEVELLING.—XXII.

(CONCLUSION.)

READINGS OF THE VERNIER.

IN concluding this series of articles, we give a few examples of the vernier, and the mode of reading it. If we take nineteen divisions of the primary scale or limb, and divide it into twenty parts for the vernier—an arrangement common in many ordinary theodolites—every one division on the limb will exceed 1-20th part on the vernier.

Fig. 50

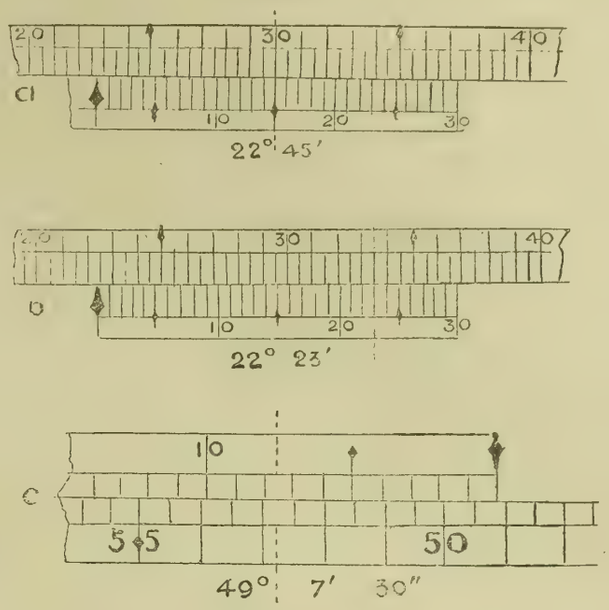


Fig. 51

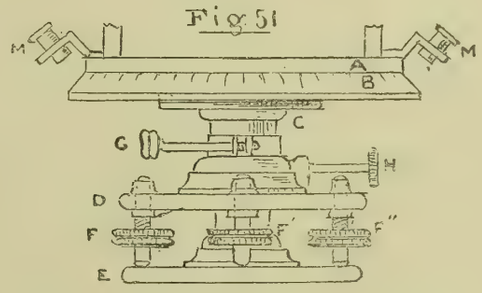


Fig. 50, *a* shows a vernier of 30 divisions, including 29 divisions of the limb. Each of the latter is subdivided into half-degrees. The zero of vernier is between 22 and 22½ degrees of the limb, the 23rd division of the former coinciding with 33½ on the limb, as shown by the dotted line. The reading consequently is 22 degrees 23 minutes. In the next example, *b*, the zero has passed 22 degrees and a half of the limb. Looking next at the vernier, we find that its middle mark or fifteenth division coincides with 30° on the limb; the reading, therefore, is 22° + 30 minutes (for the half-degree) + 15 minutes or 22° 45′. Sometimes the line of coincidence is not exactly found, but is somewhere between the lines of the division. Thus, in example *c*, the reading of the lower plate is 49° and a fraction, and this fraction we have to determine. In glancing over the vernier, which is in this example magnified, a fraction more than 7′ is recorded, or between the 7th or 8th divisions (see dotted line), therefore, the mean reading is correct, or 49° 7′ 30″. In estimating these fractions of a minute the eye is the best judge: the slightest divergence of one of the graduations of the vernier from the lower mark may be read as 15″, quite small enough to be recorded in practice. A little experience in reading the plates, as set to different marks of the limb and vernier, will soon enable the student to read to a nicety the angle; we may, therefore, merely repeat in the form of a rule that may be remembered the mode of reading.

TO READ THE VERNIER.

Notice the division or subdivision on the lower limb to which the zero of vernier points. Next look along the vernier in the same direction for the coincidence of a line of the vernier to one on the limb, and read the number of divisions on the vernier, adding it to the number of degrees and half degrees pointed to by the zero of the vernier for the reading. It must be observed that only one line on the vernier can coincide with a line on the limb.

VALUE OF READINGS.

The value of each division or sub-division on the limb is found by simply dividing it by the number of divisions on the vernier. Thus, if the limb is divided into minutes only, or 1 degree, and the vernier has 20 divisions—

60 ÷ 20 = 3 minutes, value of reading.

If each degree on limb is subdivided into half-degrees or 30 minutes, and the vernier has 30 divisions, as in *a* and *b*—

30′ ÷ 30 = 1 minute, value of reading.

If each degree is divided into three parts, or 20 minutes, and the vernier has 20 divisions—

20 ÷ 20 = 1 minute value of reading.

If each degree is divided into six parts of 10 minutes each, reduce them into seconds, or 600″, and the vernier has 30 divisions, then—

600 ÷ 30 = 20 seconds, value of reading.

CONSTRUCTION OF THEODOLITE.

The construction of the theodolite can only be practically learned by examining the instrument. The upper and lower plate, shown in the elevation, Fig. 51, which represent the lower part of the instrument, and marked A and B, are secured to the neck C as a whole. The upper plate A is fixed to a conically-shaped spindle, which passes down the neck, and which plate revolves with the telescope, which is fixed thereto by standards indicated. Upon this top plate the verniers and microscopes M M are attached. The telescope can be reversed in its standards. The lower plate B—which has a bevelled edge, and is graduated into degrees and half-degrees

which read round it in the direction of the sun (see plan in last article)—revolves round the vertical axis, and can be clamped in any position. D and E represent the parallel plates, between which are the levelling screws F, F' F' for adjusting the instrument to a line. G is a milled-head screw for tightening collar round the neck, H the slow-motion screw or tangent-screw for adjusting the lower plate. In addition to these screws, there is another, not shown, for clamping the upper to the lower plate when directing the telescope to the first of the objects forming an angle and also a tangent-screw for nicely adjusting the plates. With these mechanical adjustments the instrument can be manipulated to any position with great nicety.

ADJUSTMENTS FOR LEVELLING.

In setting up the instrument on fresh ground the eye is the best judge of the first rough placing of the tripod stand. The lower parallel plate E ought to be approximately levelled by the eye. Unclamping the parts, the surveyor then manipulates the screws F, F, F till the spirit levels record true levels in each direction, to do which one of the levels should be made to rest over the centre screw F', the other screws, F and F'', being then turned in opposite directions till the bubble is brought to its centre. Then turn the other two screws in the same manner till the level at right angles to the one just levelled is adjusted. If in doing this the first level is thrown out, the first two screws must be again turned slightly, and the surveyor has to manipulate the four screws till the levelling is perfect in both directions, to do which turn the instrument half-round, and correct for half the error. Next turn the plate round again to 180°, and readjust levels, and repeat the operation at right angles or 90°. If the levels in these various positions of the plate remain correct, the theodolite is in perfect adjustment, and ready for taking angles. Those who desire further information on surveying and levelling operations and instruments may usefully consult Simm's "Principles and Practice of Levelling," Jackson's "Aid to Survey Practice," "Practical Surveying," by G. W. Usill, C.E., and a valuable work on "Land Surveying" by W. Penman, C.E.

In our last article, on p. 515, line 26 from bottom, 45° should read 55°.

REPORTS OF ARTISANS ON THE PARIS UNIVERSAL EXHIBITION.

WE have received a bulky volume* containing the various reports of the seventy-five delegates who visited the Paris Exhibition under the auspices of the Lord Mayor for the purpose of reporting on the trades carried on in the Metropolis. As will be remembered, both employers and workers were represented at the committee summoned by Mr. Alderman Whitehead to undertake the arrangements. The delegates were picked men chosen by the workmen as their representatives; they devoted their whole time to the questions of the ways of working, quality of work, differences in make, material employed, new and original ideas, prices, wages, and mode of payment, hours of labour, whether by piecework or otherwise, amount of machinery used in production, the design and other conditions of workmanship. The idea was an excellent one, and the practical value of reports made by artisans in the various trades cannot be overrated; though the artisan is not, owing to many circumstances, so well qualified to judge of certain qualities and conditions of workmanship as one who has none of the narrowness and prejudices of training inseparable from the worker in any branch. This is probably the reason why we have so few suggestions on design. The great advantage, however, of the Mansion House scheme is the educational value to the workmen themselves in having been brought face to face with workers and products in France.

Picking out of the volume of reports, which represent no less than 64 separate trades, those which are of chief interest to artists and artificers engaged in the building industries, we may first briefly refer to the report on Bricklaying, by Mr. G. M. Pettit, which is interesting for its terse style. It will be impossible to summarise all the information given by Mr. Pettit. He says: "Bricklayers in Paris are not of a recognised standing, except in the way of chimney-stack building." The masons lay the bricks, nearly all the men coming from the north of France. No apprenticeship is necessary, as they work one year as lads for nothing, and afterwards get what they earn at piecework; the wages being from 3 to 3½ francs a day. The masons who lay the bricks in the internal walls get from 10d. to 1s. per hour, and the labourers, 5d. to 7d. The Municipal Council pay a higher rate, and the writer notes with pleasure the fact that the local boards and vestries of London are about promoting the artisan's welfare by requiring the contractor, before signing a contract, to satisfy the board that they pay their employés a recognised rate of wages. Piecework is almost universal; but the report says the brickwork "does not approach our standard of excellence," but this is not surprising when we consider only about one per cent. of the buildings in Paris are of brick. For their walls of 4½in., concrete blocks are used about 18in. square and 3½in. thick, the plastering bringing up the thickness to about 5in. The blocks are grooved all round to form a key when bedded in cement, a form of construction that is far more desirable than our thin half-brick inside walls. The construction of flues is on a very different system to that of our own country. We quote the report: "Where flues exist the walls are 9in., the flues are about 6in. by 9in., made of a block about 11in. long, 9in. high, and 9in. wide, of the same material as the brick, with the inside corners of flues rounded." Where there are several flues side by side these form flue tubes, the blocks being fitted to each other by bevelled joints, allowing only about 1½in. from the outside of brickwork to the flue, a thickness that is found to answer where charcoal-burning instead of coal is used, as the flues do not get furred by soot. The French chimney stacks are generally circular, and carried to a great height. The bricks are circular on the face, and laid heading bond with red and white bricks, and a corbelling at the head; these stacks are carried up remarkably straight, and are built by bricklayers who devote themselves to chimney-building, and are paid at the rate of 10d. an hour. The writer speaks in commendation of the technical schools for boys, and the assistance afforded by the State to boys whose parents cannot afford to pay the fees. Referring to exhibits, a fireplace and mantel of firebricks and blue joints, for standing in a stove smaller than the opening, is noticed as the best piece of work shown, also models of groining bricks and roofing tiles are spoken of as well executed. As a duty is paid on the weight of bricks, they are perforated through the end, or, more correctly speaking, they are cellular, the oblong ones being of six cells three in width and two in depth, and the square-sectioned ones 4½in. by 4½in. by 9in. of nine cells, three each way. The smaller bricks have only two chambers, and are 12in. by 5½in. by 3in. The value of these hollow bricks for building partitions, and for preventing the passage of sound is obvious. Here our brickmakers may take a lesson. In France the duty on weight has been the mother of invention; the hollow brick has many uses and merits, to which we need not now refer. The specimens of solid bricks are good, and very hard and square, weighing about 5lb. each. The duty paid on them is 6s. per 1,000 kilos (19cwt.).

The coloured enamelled bricks made in France and Belgium do not surpass the English exhibits. The roofing tiles of the two former countries are of superior make. One sort of tile is 12in. by 9in., with two "ears" at top to hang on to the laths, and perforated for nailing to lath, a hole at bottom being provided to receive wire to tie the tile to the batten to prevent its being lifted by the wind. Other tiles have a cone-shaped perforation in centre for ventilation; some are of glass, for admitting light. An iron frame to suit a number of glazed tiles as a light, that can be hinged, or to lift, is a good idea for roofing. The materials of the tiles are said to be harder and lighter than our own. The sewers of Paris are partly of stone and concrete, are larger than ours, and form subways for gas and water mains, and telegraph wires which run along the sides and crown of culvert. There are footways 2ft. 6in. wide, and the sewers are straight and lighted with the electric light. A visit to a building for station offices is described. The writer says the work was very good, the bricks white, with "headstones" (?)—stone lintels are meant—over the windows, and three rings of relieving arches of red headers. The joints were struck during erection with a "beaded jointer, leaving the joints hollow, nice, and true," which Mr. Pettit says he should like to see adopted in England. No edges project to catch the rainfall. Referring to prices, the ordinary red bricks, 9in. by 4½in. by 2in., at the manufactory, at per 1,000 are £2 2s., or £3 in Paris; cants, quarter-rounds, and splays £2 10s.; perforated bricks, 12in. by 8½in. by 4in., with six cells, £5; white bricks, £2 10s. per 1,000; roofing tiles (12in. by 9in.), £5 per 1,000; hip and valley tiles, £4. Prices are also given for sanitary pipes. The cost of living in Paris for the artisan is about £4 4s. a year per room in a third or fourth floor. Disputes in the trade are settled by six persons, three being artisans and three employers—a much more sensible way of settling trade disputes than that in favour here.

Carpentry and joinery is reported by Mr. J. C. Taylor. Speaking of wages in this branch, he says they have no standard rate in Paris, but it is a matter of bargain between employers and workman; those skilled command good prices, and contracts are often entered into. Disputes in the trade are settled in the same manner as we have described above. An equal number of employers and workmen, elected for six years with magisterial powers, sit in open court, the various trades being grouped in twelve sections; these trade magistrates are paid 100 francs a month for their services. Usually, seven form the court; but it has only jurisdiction up to £8, and cannot interfere with contracts. Witnesses can be called. The court exercises a valuable check on "sweating," a fair price is fixed upon every workman, who is registered at the Hotel de Ville and holds a certificate, which is handed to the court. There are no trade-unions, though syndicates of the trades exist, and associate at the Bourse du Travail, subsidised by the Council. Through this agency workmen obtain employment, and their trade interests are arranged. There appears to be no glut of labour on the market, the supply and demand being well adjusted. The mode of payment is by the hour, varying from 6½d. to 8½d. per hour; the workmen commence at 7 a.m., and leave at 6, and are paid for 10 hours' work seven days a week, with Sunday afternoon off. The systems of payment are various, though that generally adopted is by the hour. Mr. Taylor says the workmen are skilled, but slow compared with their English brethren; he does not think they would submit to our system of factory organisation; but he admits their work is produced at a much higher cost than that of London. The Paris carpenters are clever at large timber structures, know the principles of construction well, and produce a high class of carpentry. The artistic buildings in the exhibition ground are of first-class workmanship and finish, and carpentry is carried out to a high degree of excellence in Paris. The models of stairs are masterpieces of French carpentry, and Mr. Taylor recommends the Carpenters' Company to obtain some of these models.

Referring to new methods of construction, the writer says, while there is novelty of treatment adapted to design, their system is generally the same as our own. The general collection by Jeamin Frères of models, including spiral stairs, domes, hip roofs, splayed frame linings, mouldings, and casements, is highly commended. Another set of models, by H. Bourdoisant, is highly praised. Mr. Taylor says he never saw finer work. The Compagnons-Charpentiers, Paris, display models of buildings and stair construction, walnut and chestnut, a class of workmanship which show that the French workman is able to produce the very best work. The church joinery, choir-stalls, and pulpits are described as splendid specimens of finished joinery. Again, the grand staircase in the French section "is the finest piece of work I ever saw." The writer visited several of the churches and public buildings: Notre Dame contains oak joinery of the finest description. Workmen can now join together and contract for work up to £2,000, and syndicates or associated carpenters and joiners turn out some good work. The United States

* London: C. F. Roworth, Fetter-lane.

are well represented in the exhibition, and, together with Belgium and Sweden, are our closest competitors for commercial carpentry and joinery. English firms, like Ransome and Co., are absent. The French workmen are expert in the use of tools, and for making large mortises they use a tool like a pickaxe, which does the work expeditiously. Some good sections of French casements are shown for the meeting of stiles, frames, and a good weather-sill and rail. Mr. T. Vest contributes a report which rather clashes with Mr. Taylor's; he says the French joiners' work is inferior in construction, but far ahead of any English exhibit in design. A confessional cabinet in oak, designed by M. Uchard, architect, and executed by Simonet, Paris, is stated to be the best joinery exhibit in the Exhibition. The next is a fine pulpit of oak, designed by M. Berguet, architect, executed by Moisseron l'Andre in the South of France. Messrs. Jennings, Palace-road, exhibit a splendid display of lavatory fittings, which surpass the French in this class. Construction, says Mr. Vest, is almost overlooked; if we accept his opinion, the finish in the work is inferior to our own. Speaking of doors, they are large and massive, often 18ft. to 20ft. high, covered with heavy mouldings and carvings. Internal doors are different to ours, being 7ft. by 2ft. 6in. or 2ft. 8in. wide; the stiles and rails all of the same width, usually 3in. wide. For example, the bottom and top rails are of similar width, 3in., a middle panel in place of our middle rail, 11in. wide, inclosed by two 3in. rails. The height to top of upper rail is usually 3ft. 11in. instead of 3ft. 2in., the height in English doors. The lock is on the upper rail, the panels are the whole width of door, without muntins. Mouldings are worked out of the solid on both sides of door, the moulding is ploughed for the panel, and the back of moulding has two grooves in it, so as to fit on to stiles and rails—a plan we contend that is better than our own, although Mr. Vest does not think so. Pinning takes the place of wedging; the French joiner contends that if the mortise is made narrower at the back, and the tenons are cramped well home, this will act as wedging, which Mr. Vest denies. The door is often rebated on the two edges, which close against two fillets on the jambs, a plan which avoids draught, as it has two right angles to pass. Mr. Vest's estimate of the execution of the fittings of the Hotel de Ville does not agree with Mr. Taylor's, who says of it a high standard is maintained all through. According to Mr. Vest, no attention has been paid to seasoning; the framing is much shrunk, mitres are open, and shoulders off; the window linings and architraves are twisted, &c. Several remarks of a technical character are made on casements, segmental frames, stairs, handrails, and other matters which space precludes our mentioning. The French casement, of course, is almost general in France, the English sash system the exception. Preference is given even to our English-made French casements. The writer says: "The centre vertical joint is simply hollow on the one closing style and round on the other, which has two fillets screwed on, one on each side, and is also hollowed out so as to entirely cover the joint when closed." The bottom joint "has simply a weathered piece throated and screwed on to the bottom rail, so as just to clear the metal water-bar standing about ½in. above the sill." The casements open inwards. Mr. Vest's examination has not gone far enough. The vertical joints are not all made as he describes, if we can follow his description; here a diagram would have been of service. Mr. Taylor's sections exhibit a safe joint and weather bar. Then there are louvres fitted to all French windows, and these are a protection from both sun and wet.

Speaking of stairs, the writer observes the difference found in the French system. They assume a person moves 2ft. horizontally and the labour of rising vertically is twice that; thus the width of the tread added to twice the rise should be equal to 2ft., a rule which gives a much easier staircase. The treads have nosings not semicircular but worked with a quarter round, so that the full width of tread is retained, and in place of the scotia there is a fillet worked on to the tread. The latter is ploughed about ⅜in. from face of fillet to receive top edge of the riser, which is tongued; then the riser is let down behind the tread and is screwed to back edge. Other details are given, but the description is worthless without sections. The carpenter receives 9d. per hour, the joiner only 8d. The material used is spruce or white stuff, and joinery is largely prepared from it. With regard to tools, Mr. Vest prefers the English, and notices several differences in make; the machines used are similar to our own; as to original ideas, he declares, the French have very few worth mentioning. As to technical schools, of course he admits their superiority; while, as to design, the French, he allows, are far in advance of us. Piecework is generally preferred to day work. The cost of living is cheaper than in England, as the French workman only has two meals a day—a breakfast at 11 a.m. and his dinner at 6 or 7 p.m.

Plastering is treated by M. T. Smyth, who says the quality and extent of the work was a most agreeable surprise. The art of the plasterer is carried to the highest point. The beautiful representative structures on the Champ de Mars are examples of the plastering skill and taste of the French artist in this material. These buildings represent various styles of architecture and decoration in stone and other coloured materials. The Indian Palace, the work of English plasterers, Messrs. Joubert, of Chelsea, is an important exhibit in the ground, 180ft. in length, by about 50ft. in width, in the Early Mogul style, all the details and ornament being reproductions from Indian sculpture in the Indian Museum, South Kensington, designed by Mr. C. Purdon Clarke, C.I.E. The work was done by English workmen at 10d. an hour with lodgings, instead of French workmen at 8d. with no lodgings—a creditable acknowledgment of English workmanship. The Persian Pavilion is one of the best specimens of the art. Generally, Mr. Smyth observes, though the French methods seem to be inferior to the English, they turn out good work, but with a waste of material that would soon make an English employer bankrupt. British exhibitors are few; nevertheless Mr. Smyth affirms we are not only abreast, but ahead, and in support of this view he mentions the admirable cements in the market, and the rivalry between English manufacturers to produce the best articles at the lowest price. Mention is made of a very superior cement made by J. Robinson and Co., of Carlisle, which is said to stand a stronger tensile strain than Portland, and stands in the front rank for plastering purposes, casting, and moulding. It will carry from three to four or more of sand to one of cement for rendering and floating. The wages now given are 7½d. to 8½d. per hour; but house rents are moderate, as a man and family can get apartments for about £12 a year, and provisions are cheap. Workmen have next to no piecework, and are paid monthly, their working day being ten hours in summer, and eight to nine in winter.

We have already referred (p. 539, a fortnight since) to the excellent report on Plumbing, written by M. R. J. Lyne, which is one of the shortest; but, as he says, this was owing to the want of interpreters. Plumbing, zinc-working, and gas-fitting are combined in one trade in Paris. A complete change in the system employed is taking place, the English methods having been introduced by M. Poupard. Sanitary plumbing is being adopted very slowly, and the English system is being taught in the technical schools. Workmanship is creditable, but unequal to that shown by Messrs. Jennings, of Lambeth, in a stack of 4in. soil-pipe, and two P-traps branched into same, the best work of the kind in the exhibition. Piecework is generally adopted; but the plumbers' syndicate is against the system. The French plumbers receive 7½ francs per day, and work for 54 hours per week in summer, and 48 in winter, wages paid fortnightly. It would be impossible to refer to further details. The trades we have noticed are those of the chiefest value to our readers. Very many reflections having an important bearing on workers and workmanship occur to the mind in reading these reports on foreigh production and industries, to which we may return.

THE DRAINAGE OF LONDON BOARD SCHOOLS.

THE Works Committee of the London School Board has reported to the Board that very serious defects exist in several of the Board schools, especially as regards the laying of the drains. The attention of the committee was drawn to the manner in which the drains of the Marlborough-road schools at Chelsea, appeared to have been laid when the school was built in 1877, and again in an enlargement in 1882. The architect, Mr. T. J. Bailey, reported that he had come to the conclusion that the original drains were in their planning faulty, and in their execution rendered still worse by bad laying and taking bad directions. As to the enlargement, the clerk of the works either had too much to do, or did not recognise his great responsibility sufficiently to give the supervision drainage works absolutely require, and the contractors, through their workmen, were left to their own resources, the result being "scamped and imperfect work," expensive to the Board, and likely to be disastrous to the health and welfare of teachers and scholars. The sum of £200 is recommended to be voted to set these drains in good order. A report of changes required in the sanitary arrangements of the Clifton-road School, New-cross, has been made by the architect at the instance of the managers of the group of schools. Alterations are recommended, costing from £250 to £300, as necessary to put this school into a sanitary condition. The divisional offices of West Lambeth in the Stockwell-road, are reported as needing from £120 to £150 to be spent upon the drainage. Then, in a report of bad smells at the Warple-way Schools, Wandsworth, the superior officer for repairs, after inspection, describes certain offices to be in a foul and unhealthy condition, and recommends works which will cost £150 in the sanitary fittings and drainage. Another report has relation to the Plassey-road, Catford, the head master and mistress of which have complained that a most unpleasant smell frequently pervades the school. Inspection showed the drainage to be badly laid and badly jointed, and not at all in the directions planned. No estimate is given as to the cost of setting the drainage of this school in a proper condition.

CHIMNEY-SHAFT BUILDING.

A RATHER high chimney shaft has just been erected at Messrs. F. S. Hempleman and Co.'s Chemical works, Rainham, Essex, and forms a prominent landmark on the river side, lying about half-way between the outfall pumping station at Crossness on the Kent shore, and Purfleet on the Essex shore.

Considerable difficulties presented themselves in the foundation, as borings and sinkings proved the strata to be anything but good for such an erection, for they showed 3ft. of made ground, 4ft. loamy clay, 16ft. soft peat, 5ft. soft clay, and 3ft. of running sand, before ballast was reached. To meet this emergency, the foundation was formed with 69 piles of 12in. by 12in pitch pine, which was driven by a 10 cwt. monkey, with 10ft. fall, into the gravel, until the drive was reduced to an average of about $\frac{3}{16}$in. to the stroke. The piles having been cut off evenly, were braced by 12in. by 12in., and 12in. by 9in. stringers, and the space between them for a depth of 2ft., and up to the top of the stringers filled in with Porland cement concrete. Upon this made surface, 11in. by 4in. and 11in. by 3in. Burnettised planks were laid, and then a bed of concrete 40ft. square and 8ft. thick. This having been floated up to a perfect level surface, was left to stand for some weeks, and on being tested was found to be quite even.

The height of the chimney is 186ft., the external measurement at the base 15ft., and at the cap 7ft. 6in., the internal diameter being 9ft. at the bottom, and 6ft. at the top. The head is built entirely of blue Broseley bricks in cement, and is surmounted by an iron ring cap put together in sections with copper bolts. A 1½in. by ⅜in. lightning conductor is fixed. The shaft was built from external scaffolding to a height of 25ft., and above that from the inside. The weight upon the piles is about 1,300 tons.

The whole of the foundations and shaft were designed by, and have been executed under the immediate personal supervision of Mr. W. Seckham Witherington, F.R.I.B.A., 79, Mark-lane, E.C., and the shaft itself was erected by Mr. Joseph Blackburn, 39, Arkwright-street, Nottingham, with Mr. David Ellis as his foreman of the works.

On Saturday the memorial stone of the new Victoria Hospital at Folkestone was laid. The site selected is close to the Radnor Park, on the north side. The hospital will be built by Mr. Brooks, from designs by Mr. J. Gardner, of Folkestone.

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ILLUSTRATIONS.

NEW PREMISES IN SOUTH AUDLEY STREET.—"THE SURE REVOLVING TEST OF TIME."—HOUSE AT ELSTREE.—CHURCH OF ST. PAUL, VENICE.—WOLTERTON MANOR HOUSE.—SIDEBOARD ON VIEW AT NEW GALLERY.—SKETCHES OF METAL-WORK.

OUR LITHOGRAPHIC ILLUSTRATIONS.

PREMISES IN SOUTH AUDLEY-STREET.

These business and residential premises in South Audley and Mount streets, Grosvenor-square, are erected from the designs of Mr. Thomas Verity. The contractors were Messrs. Green and Son, of Hackney. The fronts are executed in pink terracotta and brick, supplied by J. C. Edwards, of Ruabon. Our illustration is from a photograph by Mr. J. F. Knights, of Wynne-road, Brixton.

CARTOON FOR SGRAFFITO.

This photographic reproduction is taken direct from Mr. Heywood Sumner's large full-size cartoon now on view at the New Gallery. The design illustrates an attempt at imaginative realism in decorative work, for which his very original method of polychrome sgraffito is so well adapted. Refinement of detail, coupled with boldness of drawing, is well realised in this work, wherein truth to natural forms has not been sacrificed to the necessities of a conventional and desirable flat treatment. The minor features, too, have received as careful a consideration on the part of the artist as the general effect of the whole composition.

HOUSE AT ELSTREE.

This house contains, beyond the accommodation shown on ground floor, six bedrooms, two dressing-rooms, and bath-room on first floor, with lumber-room in attic. The materials are brick for the lower part, with tile-hanging and half-timber work over, and tiles for the roofs. The interior is finished in a simple manner, the whole costing £2,350. The drawing was hung in this year's Exhibition of the Royal Academy. Mr. S. B. Russell is the architect.

CHURCH OF SS. JOHN AND PAUL, VENICE.

If our readers will turn to the Building News for June 29, 1888, a description, with a double-page illustration, will be found of the celebrated equestrian statue of Colleoni, by Andrea Verocchio, which stands in the campo in front of the school of St. Mark's, by the side of the Church of SS. Giovanni e Paolo, at Venice, as shown by our photographic plate by Brogi to-day. Whether Nicola Pisano was the architect of the Gothic façade of this fine Dominican church or not is uncertain. The monks finished the interior, and the dates given range from 1246 to 1430. The size of the building and its grand treasures of art contained within the walls cause the church to rank among the most important in Italy. Many of the monuments have been brought from other demolished churches, till at last the fabric, like Santa Croce in Florence, has been described as a national Pantheon. The church, better known really as San Zanipolo, is 330ft. long, and its width between the ends of the transepts is about 143ft. The 13th-century portals, with marble columns and rich sculptures, form a grand specimen of Italian Gothic, and the crude bas-reliefs of the 7th and 8th centuries let into the wall of the façade give increased interest historically. Above, to the right, is a tablet of "Daniel in the Lions' Den." To describe the treasures within the church would occupy more space than is here available; but among the chief objects we may name the tomb of the Doge Pietro Mocenigo, with statues by Pietro, Tullio, and Antonio Lombardo; the Renaissance tomb of Admiral Girolamo Canal, 1535; Christ on the Throne, a bas-relief from the tomb of the Doge Ranieri Zeno, 13th century; a well-restored altar-piece, by Giovanni Bellini, with the Madonna and singing angels; pyramidal tomb, by Melchior Barthel, to the painter, Melchior Lanza, 1674; Marcantonio Bragadin's monument (he who was the defender of Famagosta in Cyprus, and died in 1571, being flayed alive by the Turks, who stuffed his skin with hay, and exhibited it thus under a red umbrella); an altar-piece in nine parts by Carpaccio; monument to the 16th-century Senator, Alvise Michiel; an altar-piece showing the Descent from the Cross, by Lattanzio Quereno; the Baptismal Chapel, by Gregorio Lazzarini; the Mausoleum of the family Valier; the chapel of San Dominico, by Tirali, the architect, 1690, with paintings by Giambattista Piazetta; the Mausoleum of Nicolo Orsini; altar-piece by Lorenzo Lotto; another by Rocco Marconi; the High Altar has some fine marble bas-reliefs round it by 17th and 18th century sculptors, and the five chapels in a line with it are full of the richest monuments, too numerous to mention in this the Westminster Abbey of Venice. The church itself inside is a noble specimen of the Early Italian Gothic, one of the best known, perhaps, in Italy; the five wide pointed arches on either side of the nave give it an air of lightness very different from our more northern arcades of the same period.

WOLTERTON MANOR HOUSE.

This well-known example of the Domestic architecture of the Tudor period, situated in the small village of East Barsham, Norfolk, was built in the latter part of the reign of Henry VII., by Sir William Fermor. The building, which is now in a sadly ruinous state, is of red brick, the strings, panels, most of the mullions, and all enrichments being of moulded brick, and are, probably, as fine specimens of this class of work as any in England. The arms of England and France, supported by the Griffin and Greyhound, are sculptured over the porch in terracotta, and appear also over the entrance gate. The front of the gatehouse is very elaborate, and has on either side of the archway a figure, in moulded brick, on corbels, flanked by octagonal angle turrets, with terminals of curious design, moulded and panelled. Altogether the house is very interesting, and would well repay a visit.—Thos. M. Plaford, Norwich.

METAL-WORK FROM THE OLD HALL, GAINSBOROUGH.

These subjects need little comment, as the drawing is sufficiently explanatory. The back of a grate, bearing the date 1619 upon it, is enriched with the coat of arms of some family (whose, is not known), nicely worked in. It is now coloured. The wrought-iron dog-grate is simple and good, while the one in bronze is beautifully worked and is as sharp and clean as if done recently, though the two letters upon it indicate that it was executed in the time of Elizabeth Regina. The drawing was contributed by Mr. Henry G. Gamble, of Gainsborough.

SIDEBOARD AT THE NEW GALLERY, REGENT-STREET.

There is not much to say about this piece of furniture, as the drawing herewith given from the architect's sketch fully explains the exhibit, which is distinctly one of the best pieces of work shown in the exhibition. The material is mahogany, and the fittings are made in gun-metal. Mr. John Finch carried out the execution, and the design was made by Mr. Reginald Blomfield, M.A., the architect.

Kershaw's patent system of ventilation has been applied to the Corporation Schools, Grimsby, the patent pneumatic turret ventilators being adopted for the removal of vitiated air.

COMPETITIONS.

Inverness.—Out of seven competitive designs for a new church for the Free North congregation, Inverness, the building committee have, by the casting vote of the convener, resolved to recommend the adoption of a design by Mr. Cameron, architect. The church is designed to accommodate 1,400 people, and to cost £5,500.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

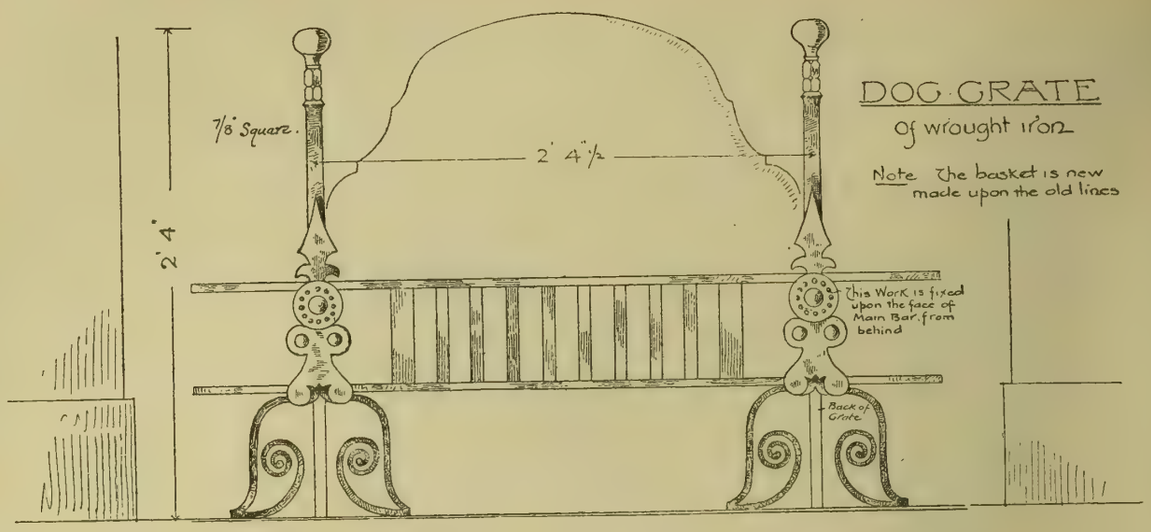
Birmingham Architectural Association.—A meeting of this association was held at Queen's College on Tuesday evening last, the President (Mr. T. Naden) being in the chair, and Messrs. Bidlake, Bateman, McConnal, Harrison, and H. R. Lloyd, and others being present. The President gave his annual address, in which, after referring to the excellent nature of the papers read at the meeting of the previous session and the general success which had been the noticeable feature during that time, he proceeded to describe the present system of education for the profession of architecture, pointing out that the failure of an articled pupil to acquire a sufficient knowledge of the wide range of subjects which it was necessary for him to study might be due to his own or his master's carelessness; but that his success invariably depended upon his own determination to avail himself of all the opportunities of gaining experience which might come within his reach. Mr. Naden then passed on to review the subjects which an architectural student should endeavour to master, and to lay down the general principles which should guide him in his studies. Several other gentlemen having spoken, a hearty vote of thanks was unanimously passed to Mr. Naden for his able address, to which was coupled an expression of the pleasure with which the members welcomed him as president for a second time. The hon. sec. announced that papers had been promised during the coming session by Messrs. G. A. T. Middleton, A.R.I.B.A., C. J. Hart, A. B. Mitchell, A.R.I.B.A., F. B. Andrews, A.R.I.B.A., F. Barry Peacock, C. E. Bateman, Herbert R. Lloyd, A.R.I.B.A., W. H. Kendrick, H. H. McConnal, A.R.I.B.A., W. Hawley Lloyd (vice-president), and Aston Webb, Hon. Sec. R.I.B.A.; and also that at the annual conversazione, to be held on 13th November, Messrs. Herbert Railton, Aston Webb, Phené Spiers, Gerald C. Horsley, and Ernest George, and many others had promised to lend drawings for exhibition.

Institution of Civil Engineers, Manchester Branch.—The opening meeting of the sixth session of the association of Manchester students of the Institution of Civil Engineers was held on Wednesday, October 23, at the Athenæum, Manchester, the president, Mr. J. Proctor, M.Inst.C.E., in the chair. The untimely death of the past-president, Mr. R. Vawser, M.Inst.C.E., was referred to, and a vote of condolence with his family was unanimously adopted. The president then gave his inaugural address, in which he drew attention to the objects of the association, and to the education and training necessary to make men good engineers, including a knowledge of chemistry, geology, and the various branches of the drawing department, &c. He hoped that before long a paper would be read as to the cause of the high death-rate in Manchester and other towns, with suggestions as to the best means of reducing the same. He referred to the purification of rivers, and expressed an opinion that action should be taken against owners of works on the rivers to cleanse the same as well as against local authorities. A vote of thanks to the president was proposed by the hon. sec., Mr. A. D. Greatorex, seconded by Mr. A. W. Lawson, and carried unanimously.

CHIPS.

Mr. Henry Capner Marks, Assoc.Mem.Inst.C.E., borough engineer and surveyor of Dewsbury, one of the selected candidates, has withdrawn his name from the list of applicants for the city surveyorship, York, the town council of Dewsbury having passed a resolution increasing his salary so as to retain his services.

A company has been formed at Pocklington for the construction of waterworks. The inhabitants at present depend upon an indifferent and limited supply, and the town is wholly unprotected against fire. Messrs. Fairbank and Son, M.Inst.C.E., of Driffield and Westminster, are the engineers.



DOG GRATE
of wrought iron
Note The basket is new made upon the old lines



Sketch of Dog

SKETCHES OF METAL WORK



BACK OF A GRATE

FROM THE OLD HALL GAINSBOROUGH

From Measured Drawings by Henry G. Gamble

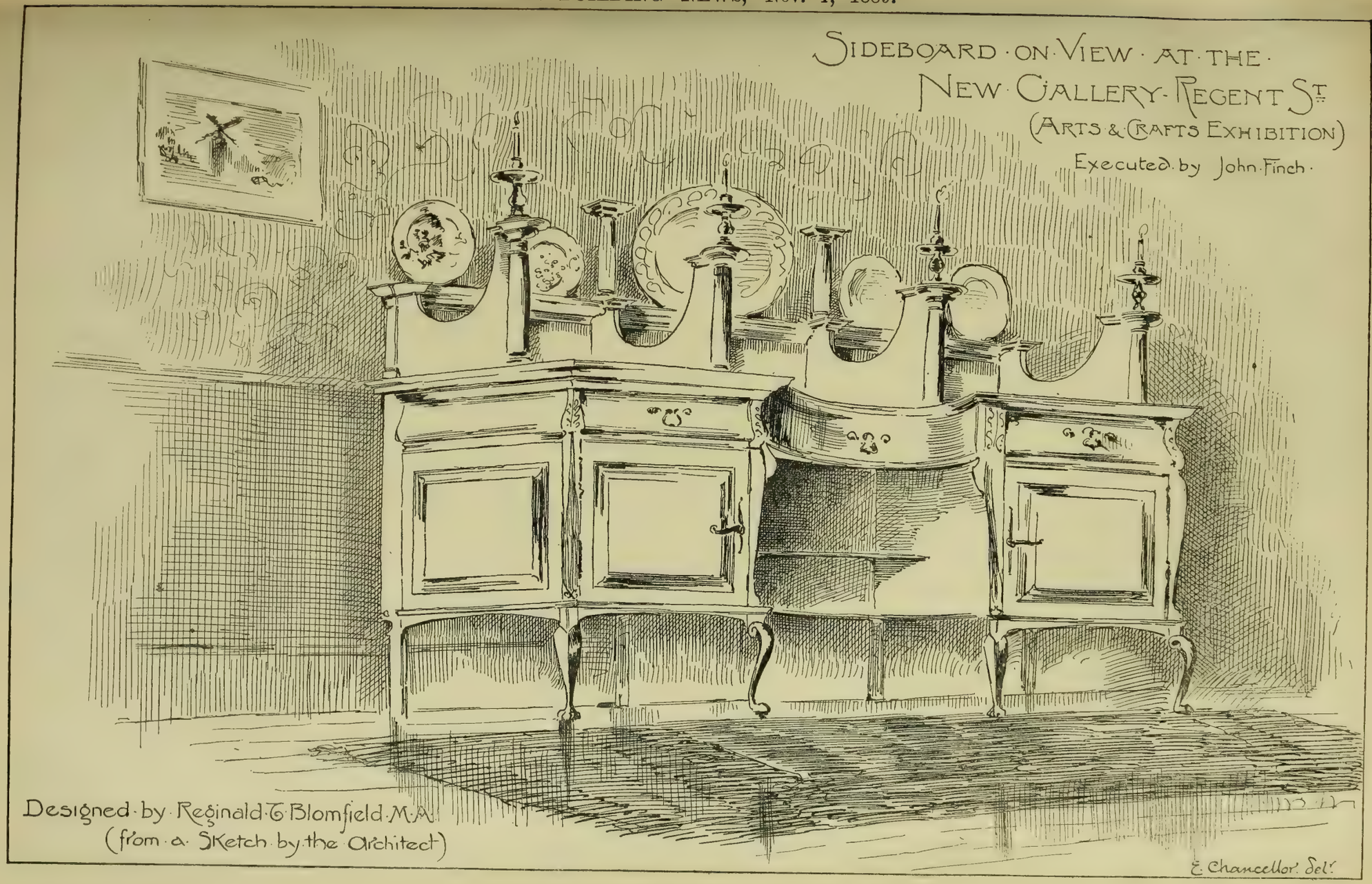


Sketch of Dog

DOG GRATE
of hammered bronze
Note The bronze work is fixed upon an iron plate

Note. This is a new basket made upon the old lines

E. Chancellor Del.


SIDEBOARD ON VIEW AT THE
NEW GALLERY REGENT ST.
(ARTS & CRAFTS EXHIBITION)
Executed by John Finch.
Designed by Reginald T. Blomfield M.A.
(from a Sketch by the Architect)
E. Chancellor Del.

WAYSIDE NOTES.

CRITICS in plenty were found to carp at the foundation of the National Art Association. The first meeting of that body, however, was attended with the success that more hopeful people had anticipated, and the second congress, holden in Edinburgh, bids fair to prove equally successful. For my own part, I feel convinced that anything in the way of meetings or congresses devoted to the discussion of art matters is so much seed-sowing, that will in the near future bring forth good fruit. That a wider interest in art matters is commercially beneficial to the nation is a statement nowadays accepted as a truism on all sides; and that a spread of enlightenment on principles of the beautiful in all art is calculated to advance the interests of artist, sculptor, and architect we have few of us any shadow of doubt. My views on the National Art Association I gave at the time of its formation, and see no cause to alter them. Properly conducted, it should have a prosperous future before it, and one of great service to the community at large.

The great interest evidenced in architecture, and the regard shown for our art in relation to the handicrafts, are circumstances particularly gratifying to ourselves. Not only is the architectural section well maintained, but the dissertations upon other arts are well in touch with architecture. The presidential address of the Marquis of Lorne was redolent of architecture, the subject dominating in the discourse in a most pleasing (though, of course, only a natural) way, if the arts as a whole are treated in a broad spirit. The noble marquis's discourse, however, was not above criticism. Much, indeed, of the sentiment expressed therein was such as only springs naturally from the lips of a layman, and calculated to make one wish that the President of the N.A.A. might be by compulsion a professional, either architect, sculptor, or artist. Scotch architects, I fancy, both of the shadowy past and tangible present, would scarcely feel flattered by the declaration that churches in the bonnie land are "as ugly as sin." As a set-off against digressions of this nature, one may, however, fairly place the President's plea on behalf of glazed-ware fronts for smoky towns, which, say what we will about the beauties of surface-texture, is a material that forces itself upon us as being eminently adapted to city façades.

In the *St. James's Gazette* of Tuesday evening last I noted a communication touching matters of building and architectural import, possessing more than ordinary interest to the architect. It was headed "English Law and French Justice," and was the tale of alternate weal and woe, or *vice versâ*, told by "a long-suffering tradesman and householder." To put the matter in a nutshell, our friend had had a difference with some contractor over a bill of extras, and, having gone to law, was mulct to the tune of £650 law costs, the sum haggled about being ultimately settled at little more than £100—a pretty good piece of business for the lawyers. The job consisted of repairing a small country house, and the work "was done in the best style of jerryism. The gas-pipes leaked, the rain came through the roof, the paint washed off, and the rotten wood, instead of being cut away, was stopped with soft putty and painted over." The architect had declared the builder already overpaid, but in spite of all, after the usual delay and paraphernalia of the law, the result was as related above. This was the woe.

The *weal* related to a building experience in France. The *St. James's* correspondent had had some work done by a builder in Paris, and a claim of 300 francs resulted as "extras." Considering himself overcharged, he placed the account in the hands of an *architecte vérificateur*, who reduced the amount by one-half. Result, the case came before the Juge de Conciliation, the *a. v.'s* certificate was confirmed, and a small charge for the expenses of justice and 5 per cent. for the *architecte* settled the affair. Comparisons are odious, we know; but there is something of a contrast between these cases, and all, excepting perhaps the British surveyor, who gets much grist for his mill from light-and-air and arbitration cases, will cry, "They manage these things better in France!" The English builder, however, may perhaps smile a smile of satisfaction, and, as for our jerry-building friend, which his name is Buggins, he will puff that Sunday cigar, which he told me, in all seriousness, he smoked to please the "missus," with something of pride swelling beneath his manly bosom.

The concluding remarks of the *St. James's* correspondent are most practical, and touch upon the absence of jerry-building in Paris, a fact to which I have often called attention as proving that building regulations are also more of those things that they manage better in France. One of the greatest pleasures to myself, when by good fortune I am blessed with such a consensus of favourable conditions as leads to a run on the Continent, is to pass from the jerry-building of England to the solid construction evidenced without exception in the streets of many European cities.

Mr. G. R. Sims, who, in his contributions to the *Referee*, has already done very great good in the cause of sanitation, must be hailed as a friend indeed by all true architects and Registrationists. Writing last week, Mr. Sims alludes to Mr. Ritchie's speech at the Mansion House on Tuesday week, wherein the energetic father of county-councildom foreshadowed a scheme he intends bringing before Parliament for the solution of many social problems, particularly touching the housing of the poor, and the amelioration of tenants' grievances, a measure, in fact, that shall be like the heralding of a millennium to a certain stratum of society. Enthusiastically welcoming the proposed scheme of Mr. Ritchie, Mr. Sims writes, however, "Does it provide for an alteration in the present gross condition of affairs with regard to architects and surveyors? It is useless talking about unsanitary houses being made sanitary while everybody who chooses to do so can set up as an architect and surveyor without passing an examination. It is to this fact that we are indebted for the multiplication of unsanitary houses all over the land." Bravo! "Dagonet"; if a few more popular writers like yourself would take in hand the matter of the Registration of architects, things would soon be different.

I make no apology for directly transcribing the following paragraphs from Mr. Sims' pen:—"At the present moment all you have to do to commence business as an architect or surveyor is to open an office and put a brass plate on your door. There is no examination necessary, no diploma to be obtained. The man who draws your tooth must be registered and qualified; the man who builds your house and lays your drains—the man in whose hands lie the health and the life of dozens of families, sometimes of an entire town—need not be qualified at all. . . . Some time ago there were practising in one town in England as architects and surveyors a shoemaker, a miller's carman, a shipwright, a bricklayer, a Wesleyan local preacher, and an unsuccessful schoolmaster. The shoemaker did a bit of speculative building, and became chairman of the local board of health. The miller's carman became borough surveyor, and, as agent to a big landowner, laid out the greater part of a town for 40,000 inhabitants. The shipwright is at the present moment surveyor of a town in the Midlands. The bricklayer, after a spell of architecture, turned it up, and when last heard of had a little grocery shop. The Methodist minister is now surveyor to the rural sanitary authority; but the schoolmaster has abandonded architecture and surveying, and is now a commission agent." A delightful and edifying state of things truly, and one to be noted by those who may still deem the Registration of architects to be unnecessary.

Many other pertinent remarks does Mr. Sims make upon the subject of the Registration of architects, and right glad am I to see that he has thus taken up the question with such vigour and thoroughness, and in a manner that indicates strong convictions as to the necessity for some measure dealing with the examination and Registration of those who profess and call themselves architects. As I have frequently pointed out, it is public attention—viz., that outside the ramparts of the profession—that requires to be attracted. There are no real ramparts or lines of the defence, though, for the happy band of the handmaidens of architecture; still, for the sake of effect, I will talk about the "ramparts of the profession," and urge that it is outsiders that require to be informed. Although, for party reasons, it is pitiable to think, we in the ranks of the glorious profession, that, while possessing so many good men and true, yet may boast of including shoemakers. millers' carman, shipwrights, and bricklayers, Wesleyan local preachers, and unsuccessful schoolmasters—it is painful to think that, whilst at heart Registrationists, we are as a house divided against itself—outwardly at variance, while inwardly holding a similar creed. This desired public attention is only to be attracted through the public Press, and where some popular writer will enthusiastically employ his power in educating his readers to the requisite point, he is certainly deserving of all the encouragement we can show him. Much power, then, to "Dagonet," and will he observe that the fact to be impressed upon people is that anyone may call himself an architect without let or hindrance of what kind soever. He will be not a little entertained to find how gross is the ignorance on this point, and stir up not a little indignation in those otherwise easy-going parties who believe that what is is right, and never allow themselves to reason otherwise, until some kind friend points out to them the error of their ways.

GOTH.

BOOKS RECEIVED.

The Amateur's Workshop, by the author of "Pattern Making" (London: Swan Sonnenschein and Co.), is a reprint of a portion of a series of articles which appeared in the *English Mechanic* a few years since, the first chapter having appeared in that journal on Jan. 13, 1885. The subject matter has been rearranged and revised, new matter is added, and descriptions of new machines and appliances are introduced, so that the work is well up to date, and will be found invaluable by the amateur engineer, supplying, as it does, reliable information respecting the principles of construction and modes of operation of engineers' machines and tools, and hints respecting their judicious selection. In several cases sufficient details and dimensions are given to enable amateurs possessing some skill to construct machines for themselves. The work is divided into two parts, treating upon "machines" and "tools" respectively, is illustrated by numerous woodcuts, and is well indexed.——Vol. XV. of the *Proceedings of the Association of Municipal Engineers* (London: E. and F. N. Spon) contains the papers read before the Association in 1888-9, most of which appeared in full or summarised in our columns, and an index to Volumes I-XV. This has been edited by Mr. Thomas Cole, A.M.Inst.C.E., secretary of the Association.——Three handbooks for the examinations of the Science and Art Department have been sent us by the publishers, Messrs. Chapman and Hall—viz., *Introductory Lessons on Quantitative Analysis*, by John Mills and Barker North; *Machine Construction*, solutions to the questions set from 1881 to 1886 at the May examinations, by Professor Henry Adams; and *Elements of Physiology*, by Dr. J. H. E. Brock.——Mr. Fred Wetherfield, of 2, Gresham-buildings, the legal editor of the *Weekly Times and Echo*, has just published a most useful sixpenny digest of the Patent, Designs, and Trade Marks Act, which should find a place on the desk of every business man and inventor.——*Cromer, Past and Present*, by WALTER RYE (Norwich and London: Jarrold and Sons), is an attempt to describe the parishes of Shipden and Cromer. In Chapter I. Mr. Rye gives a description of the buried town of Shipden and rising health resort of Cromer, which is 21 miles north of the Castle Hill, Norwich. Shipden is now a quarter of a mile out to sea, and at the lowest neap tides the water recedes far enough to reveal broken foundations matted with seaweed, ridges over walls, which hardly appear above the sand, and the overturned mass of squared flintwork called "Church Rock," once the tower of Shipden church. We need not dwell on Mr. Rye's theory that these Norfolk villages took their names from Danish or Norsk settlers—Cromer is thought to be a Danish place-name. Shipden must have been, in Tennysonian phrase, a "haven under a hill"; in the fifteenth century, or before, it lost its name, and the port was called Cromer, or Cromer alias Shipden. The manors and facsimiles of the entries about them in Domesday Book are described, the sea-traders and townsmen; and the fourth chapter gives an account of the churches. The old church of St. Peter fell a victim to the encroaching sea in 1337, and the new one was a fine edifice begun about the same time. The chancel

spoiled after the Reformation, is now in ruins, its destruction having been sanctioned by the Bishop of Norwich in 1681 to save the cost of rebuilding. At this time the arch and aisle were stopped up with masonry, leaving traces of the pillars between chancel and its aisles, which must have been a long and fine addition to the body of church. In 1767 the roof of nave and aisles fell in, and the fabric fell into neglect, and was patched up in Churchwarden Gothic. The style of nave, aisles, and west tower of this later church is Perpendicular, the church having been recently restored by Mr. Blomfield. The tower is a fine example of flint flush work, and some illustrations of its treatment are given in Mr. Rye's book; the upper part of tower is particularly interesting. Various details are given, including the plan and details of the pillars, the panelling of buttresses to tower, ornaments of tower doorway, the north and south porches, and panel ornaments. The monuments in the church and churchyard inscriptions form an interesting appendix to the volume, the profits of the sale of which is to be given to the Cromer Church Restoration Fund.

THE NATIONAL ART CONGRESS AT EDINBURGH.

THE second annual congress of the National Association for the Advancement of Art and its Application to Industry is being held this week in Edinburgh. The opening address was delivered by the Marquis of Lorne, the President, at the Queen-street Hall on Monday night. Having reviewed the points dealt with at last year's congress at Liverpool, he drew attention to the encouragement which is given to the arts on the Continent, and particularly in France. In this connection he urged the need of establishing a closer relation between design and workmanship. He went on to put in a plea for the exercise of greater taste in domestic architecture; and while pointing to the improvement in design in jewelry, he urged that this same improvement might be carried into various forms of household ornament. Taste was not incompatible with simplicity of ornament, as he showed by reference to the ornamentation adopted by the early races in this and other countries; and he showed what an important part colour could play in ornament, and urged that greater taste in this respect could be shown in the exteriors of our buildings. In Edinburgh they lived, he remarked, in a climate where one would imagine any colouring would be welcomed, and yet they were content with the gloomy and monotonous greys of our stones, or if anything was done to alter this, they plastered on whitewash, which only looked well when quite fresh. Then they put a border of black round each window, and having made their houses look as much as possible like a sheet of mourning note-paper, with square perforations, or having succeeded in making a village appear like a set of badly-used dominoes, they sat down quite content, and let the rains subdue these brilliant efforts by making all the black edges drizzle down in veils of dirt across the surface of white. The London white surface bricks were now successfully used, and frost did not injure them. Why not have other colours? Why should not the smoky streets of Manchester and other towns, still more those under the smoke pall of the Black Country, not be made to look as bright as colour and glazed tiles could make them, with the occasional wash-down from a street hydrant?

On Tuesday the sectional meetings were opened.

IDEALISM AND REALISM IN ART.

Mr. Briton Rivière, R.A., delivered the presidential address in the section of painting. The most remarkable achievements of the age had been, he observed, those of science, and, properly applied, the influence of science could do much to advance art. It was possible for a picture to be scientifically true and have no art at all in it; and, on the other hand, it might contain several scientific blunders, and yet be a great work of art. As to the absolute necessity for the union of idealism and realism in the artist's work, Nature supplied the materials, but it was in the power of the artist to select, to arrange, to organise, to intensify, to subordinate them as he pleased. The traditional standard counterbalanced and regulated mere realism, without which idealism itself would never be able to do its best. Tradition had always been the abiding power in art. The qualities which would characterise the art of these days, if it were to be a permanent link in the great chain of art history, were that it would be perfectly sincere, that it would be work in which realism was used not only for its own sake, but as a language in which to express the mind of the painter. He believed that, however apparently revolutionary its aim, and however original and even eccentric some of its methods might appear, it would in the main be in harmony with and founded upon the great traditions of the past.

THE NATIONALISATION OF ART.

A paper by Mr. G. F. Watts, R.A., on the "Nationalisation of Art in this Country," was then read for the author in his absence. In modern times it had come to be thought that beauty and utility were not only two different things, but were actually antagonistic, and yet art, to fulfil its mission perfectly, must have a thoroughly natural and domestic expression. Never was a time when art and music were more required as healthful influences for necessary portions of that general education in which alone there is hope. But the modern mind awakened to the sense of the value of beauty and joy was confronted by the new enemy to art, the progress of invention bringing mechanical aid more and more into use, and usurping more and more the place of the skilled workman's eye and hand. Machinery was the most deadly foe to art and beauty, because it was ever in active opposition to the sense of life that should be appreciable in all human productions. To preserve the human element in work for the sake of work alone was worth a great effort. He begged lovers of art to recognise the immense and valuable help they could give by the encouragement of all such work as tended to teach the working classes to love and honour it. In the activity of the Home Arts Association, the Handicrafts Guilds, and kindred associations they had all that was most needed to revivify what was naturally artistic in the British Islands. When the nation understood that its art was inextricably bound up with all its material prosperity, its spiritual life, and intellectual vigour, then, and only then, would Britain boast an art that would live for future ages by the side of her great and noble literature.

GOVERNMENT SCHOOLS OF ART A FAILURE.

Mr. J. E. Hodgson, R.A., then read a paper on "Some of the Causes of the Failure of the Government Art Schools and Possible Remedies Therefor." Our art schools had opened a career to men of limited means which required a considerable outlay of time and money. They had taught superficially what was only valuable when thoroughly and profoundly acquired, and they had produced a vast mass of raw material which they were powerless to fashion. After many years of education art as applied to manufactures was much as it was. Instead of the artist educating the manufacturer the manufacturer educated the artist, and he at least knew his market. The administration of our art schools should be decentralised, and the country cut up into so many districts, each with an independent central department, which should concern itself specially with the manufacturing needs of the district. In the art schools of the Potteries districts the students should be taught all that appertained to the ceramic art, and the certificates granted to teachers should be given for proficiency in the special study of ceramics. In every place where there was a local industry the art schools should specially minister to that industry, and these schools would not only educate workmen, but would enable the manufacturer to educate himself. The manufacturer wanted men whose judgment had been improved, and whose knowledge had been extended by steady attention to one object and by frequent exercise. In our art schools we had all the machinery necessary for producing such men, but with their present uniform and stereotyped system of education no such result was likely to be brought about.

NUDE MODELS IN SCHOOLS OF ART.

Mr. J. C. Horsley, R.A., delivered an address on "The Royal Commission on the Fine Arts (1841) and the Government School of Design." When officially connected with the School of Design he was, he said, informed that a minute of Council existed forbidding the employment of naked female models in any of the schools connected with the Department. Now, every female student was offered the opportunity of assisting in the degradation of her sex. Upon the Slade and South Kensington schools lay the guilt of initiating and fostering models of study that led to the practice of such enormities, and it was the governing powers of both that should be called to account for permitting them. He declared the South Kensington Art system to be a failure, and said that a public and searching investigation was peremptorily demanded. He entreated Christian men and women to do their utmost towards bringing to their senses those senseless female art students of their time, who, in their preposterous efforts to unsex themselves, and claiming front places on the male platform, bring dishonour and contempt on themselves and their country. Many women were sent into the world with delightful and admirable artistic natures, and produced work of high interest and charm. To attempt the highest walks of art was, however, an utter mistake on their part. It would be a beneficent Act of Parliament, indeed, to themselves and others that made the proceeding illegal and punitive.

Mr. Forbes White, of Dundee, said that the remarks which fell from Mr. Horsley with reference to ladies were uncalled for and unjust. He had the honour to know several ladies who had studied in the life schools in Paris, and they had not conceived one iota of wrong or harm from the teaching of these schools. He protested in the strongest way against the innuendo which came at the close of the address that such work should be made illegal.

Miss Burton said that if it was bad for a woman to be working in the way Mr. Horsley described, it must be bad for a man.

SCULPTURE.

Mr. Onslow Ford, A.R.A., delivered the presidential address in the section of Sculpture. He asked was it not deplorable that our art schools were not receiving the attention due to them? There was no branch of art that had suffered more from withering influences than sculpture. It had been his privilege to examine works of art at South Kensington, and it was gratifying to find that every year the quality of the work was better. How sad it was to think of the immense proportion of all this talent bound to run to waste through the state not having the courage of its opinions. The appointment of a Minister of Fine Arts was, he thought, the only remedy for the present state of things, and if he gained his post through a majority of the votes of the artists of the United Kingdom, so much the better.

Mr. G. Webster read a paper on "Sculpture as it Was, Is, and Ought to Be," and Mr. D. W. Stevenson, R.S.A., read a paper on "The Picturesque in Sculpture," with limelight illustrations.

In the evening two lectures for working men, one on "Dyeing," by Mr. William Morris, and the other on "Decoration and Illustration of Books," by Mr. Walter Crane, were delivered in the Museum of Science and Art.

ART AND THE PEOPLE.

Mr. William Hole, A.R.S.A., read a paper on this subject on Wednesday. Mr. Hole said that the function of art was not necessarily to picture things of beauty, but to be beautiful. The crucible of the artist's brain received the rough form from nature, and purging it of extraneous matter gave forth, as a pure product, the spirit which was his thought. Lacking this gift—and it was among the rarest—the would-be artist was but a skilled mechanic. Faithful, patient, conscientious, learned—all these he might be; but artist he was not, for all the virtues never yet made one. Subjective art appealed most readily to those initiated into the higher mysteries of beauty, and a painted story, an attractive prospect, a comely face, or an exciting incident, apart altogether from artistic merit, had only to be seen to be admired and find a purchaser; while the unassuming canvas which with true originality revealed some phases of loveliness in nature undreamed of hitherto, was passed by as uninteresting. Even when art acknowledged to be great was publicly exhibited, it was treated with neglect and indifference.

POLITICAL INFLUENCE OF ART.

In the combined sections of sculpture, architecture, and national and municipal encouragement of art, Mr. Philip Rathbone, of Liverpool, read a paper on this topic. He said that while any forms of art might add grace and might tend to refine daily

ife, the fostering of patriotic feeling was the province of monumental art alone. Galleries of pictures were not monumental in themselves. The three phases of monumental art were architecture and the two sister arts—decorative sculpture and mural painting. No national monument was complete without these. Westminster Abbey had been turned into a dolls' warehouse by cramming it with images carved with no consideration for the architecture of the building. We had done our best to eradicate from architecture any historical and human interest. The whole of the town-halls of modern England would only tell future generations that certain of our fellow-citizens wore coats and vests of a most ghastly colour. All public buildings should be adequate monuments of civilisation. In order to attain this end it was necessary to call into requisition sculpture and fresco painting or mosaic work.

On Wednesday the section of Architecture was opened.

THE USE AND DECORATION OF PUBLIC BUILDINGS.

This was the topic of a paper read by Mr. E. Roscoe Mullins, who said that subjects for decoration must naturally vary according to the nature and object of the building itself, and it would be futile to try and fetter the imagination by any hard and fast lines as to what is and what is not suitable. The only difficulty sculptors had at present to contend with was to find a fitting place for work that was commemorative, but of a more abstract and ideal character. He did not speak hopelessly, for there were many signs that people were beginning to think and feel widely about these things, and that the long-prayed-for unity of the arts was on the horizon in the near future.

MUNICIPAL LEGISLATION WITH REFERENCE TO ARCHITECTURE.

A paper on this subject was read by Sir James Gowans, Lord Dean of Guild of Edinburgh, who declared that so far as Scotland was concerned, there was no legislation which practically bore on their question. The Courts of the Dean of Guild in Scotland have not, he explained, by common law, or by statute, any direct control in questions concerning the style of architectural treatment to be adopted, or the kind of material to be employed in the construction of buildings—their functions being limited, though somewhat varied between "lining," as it is called in Glasgow, that is fixing the lines or boundaries of adjoining properties, and in Edinburgh to questions specially of stability and sanitation. The Municipalities, as distinguished from the Dean of Guild Courts, have no other power than that of the negative one of restricting the height of buildings, and setting back the lines of properties causing obstruction, when these happen from demolition to afford an opportunity of correcting the lines of frontage at the public expense. Even this power cannot be traced further than the Police Act of 1848. So long ago as 1424, in the reign of James I., statutes were enacted which enforced that buildings should be restricted to two stories in height with dormers, or three stories at the utmost; from which it appeared that 22ft. ladders were considered long enough for use in case of fire, in all burghs in Scotland. This is the origin of the existing law of keeping back buildings on public highways, throughout Scotland, a distance of 25ft. from the centre of the roadway. In England there is no jurisdiction corresponding to that of the Dean of Guild Courts, and such architectural authority as they have is necessarily exercised by the whole municipal corporation. This, according to Scottish lights, is a clumsy and impracticable way of disposing of such business. In Edinburgh, such a course would be a waste of time. Passing on to the question whether it is desirable in the interests of communities that legislative power should be got for controlling the architecture of buildings, or defacements of an injurious kind, and how it should be effected, Sir James Gowans said he should not suggest the subversion of these Courts of Guild, but felt that some control ought to be exercised over buildings. Of Edinburgh, at any rate, it might be said "her face is her fortune." He would propose to confer upon the Dean of Guild Courts at least negative power with regard to the proper architectural construction of buildings. That is to say, that the Court should, in the first instance, decide whether any building was in itself, or in relation to its architectural or natural surroundings, or other considerations, objectionable, and affecting public propriety and interest, and that there be, if it is desired, an appeal to a court of taste to be constructed of, say, the following:—The Principal of the University, Professor of Architecture (if such a chair could be established), Professor of Art, President of the Royal Scottish Academy, Chairman of the Board of Manufactures, Chairman of the Cockburn Association, and the President of the Architectural Association. But second, and of not less importance, it should be enacted that only architects having the guarantee of professional knowledge and ability authenticated by their position as members of an architectural association, constituted by law, equivalent in its own department to that of law, or medicine, should be privileged to prepare plans for the Dean of Guild Court. As matters stand, while the most trivial petition to sanction a plan was in most cases presented by a procurator, the plan may be the production of any person who has had no training to qualify him as an architect. It was no exaggeration to declare that men entirely destitute of any enlightened ideas of architecture were constantly employed to carry out what they are radically incompetent of doing. In conclusion, he urged that more extended and effective powers than now existed should be vested in some responsible authority; and that one means, and an essential one, was that the profession of the architect should be authoritatively placed on a higher and more responsible position than at present.

Dr. Rowand Anderson said that in this country architecture was in a more vigorous condition than in any other country in Europe. This he believed to be entirely attributable to its freedom from any State control. Sculpture as an art had languished very seriously, more in the North than in the South, and this he believed was entirely due to the association of sculpture and architecture, and to the cultivation in academies of a class of sculpture quite unfitted for the climate, and even for our very homes.

In the discussion that followed, Mr. T. Blashill, architect to the London County Council, said he thought there should be some sort of censorship armed with power to reject, and not afraid to say that one design was too poor for the position, that another was radically bad, and that a third was discordant with its surroundings. Professor Baldwin Brown said that they must look for improvement to the action of enlightened public opinion, not only on the part of architects themselves, but on the part of the public.

Papers were read by Mr. W. F. Yeames, R.A., dealing with "Competitions and Exhibitions"; by Mr. W. S. Black, on "Hindrances to Applied Art"; by Mr. J. Starkie Gardiner, on "Designing for Wrought Iron and Other Metals," and "The Application of Enamels in Decoration"; by Mr. H. H. Statham, on "Architectural Effect in Cities"; by Mr. W. D. McKay, on "Traditional and Modern Methods in Oil Painting"; by Mr. Thomas Bonnar, on "Suggestions for the Picturesque Treatment of Interiors"; and by Mr. Walter Crane, on "Design and Material."

CHIPS.

Tabb's Hotel, Redruth, is about to be thoroughly restored and renovated, under the superintendence of Mr. James Hicks, M.S.A., of that town. The smoking-room is to be furnished and decorated at a cost of £500.

The new post-office erected at Long Sutton is completed. The architect is Mr. Holmes Hand, of Spalding, and the contractors were Mr. James Goodman, bricklayer, Mr. Solomon Warrick, stonemason, Mr. John Ream, carpenter, and Mr. Pulford, plumber and glazier. The plinth and strings, window-heads and jambs, cornice, date panel, corbels, and coping are of Ancaster freestone, relieved in places by the insertion of red. There are also raised and sunk panels of red pressed bricks below the windows and above the cornice, and the piers are of the same material. Beyond the post-office, extending about 60ft., are new stables, &c.

An obelisk 50ft. in height is being built on Dennis Hill, near Padstow. It will commemorate the Jubilee, and will contain over 120 tons of granite, all supplied by the St. Breward Granite Co. Mr. Nicholas Robins, of Padstow, is the contractor.

The new church at Easington, near Loftus-in-Cleveland, was opened for public worship by the Archbishop of York on Monday. The church has been built, at a cost of over £3,000, by Mr. Thorpe, of Leeds, from plans by Mr. Fowler, F.S.A., of Durham.

Building Intelligence.

BOLINGBROKE.—The parish church was re-opened on the 10th inst., after restoration, from plans prepared by Mr. James Fowler, of Louth. As it stood before the present works were begun it was simply a south aisle to the former much larger and more important church, the foundations of the chancel and other portions having been found during the restorations. This aisle—the present old portion of the church—measured 59ft. by 24ft., and in the north wall of it was found in a well preserved condition the arcade which at one time separated it from the nave. Soon after the restoration the ruins of the nave and chancel were removed. The east side and part of the north and south sides of the tower were rebuilt, and the south arcade built up to form a smaller parish church, and with the exception of a new roof, of the barn type, the building thus left remained until last year. The old pen-like fittings and the barn roof have been taken away and the north arcade opened out. On this side an aisle has been added utilising the arcade. A new roof of panelled waggon-head shape has been erected to the original pitch, the windows have all been restored, and buttresses erected against the walls; a porch has been built on the south side, and the tower has been furnished with a parapet ornamented with eight pinnacles. The floor has been lowered to its original level as found by the bases of the pillars, the eastern bay raised to its original level, and now separated from the nave by a low stone wall with iron gates; upon this on the north side is a carved lectern, and at the south end it is projected forward to form the pulpit. Within this on the south side are the ancient sedilia, now restored and brought into use, and on each side are double rows of stalls and carved oak. At the east end of the north aisle a vestry is formed by oak screens. The nave has been fitted with stained deal seats. The ground has been lowered about the building to a great extent—some 5ft. on the south side. Messrs. Walter and Hensman, of Horncastle, were the builders. The cost was about £2,500.

EDINBURGH. — Plans for the International Exhibition to be held in Edinburgh next year have been prepared by Mr. William Allan Carter, M.Inst.C.E., engineer and architect to the committee, with the assistance of Mr. Frank W. Simon, architect, and Mr. Penman, C.E. The buildings will consist of two main blocks—the one devoted to the housing of general exhibits, and the other to installations of machinery and all kinds of electrical appliances. The former will be situated to the east of the Suburban Railway, while the latter will be to the west of that line. At one side of the main entrance gates will be erected the offices for the accommodation of the executive staff, containing rooms for the manager, secretary, treasurer, and architects on the ground floor; while on the first floor will be provided meeting-rooms for the executive council, committees, and dwelling-rooms for the manager. This building will be constructed in timber and plaster, and suggestive of the old timber work met with in the Midland counties. The canal will be crossed by means of an iron girder bridge, over which an awning will be formed. The main building stands at a distance of about 170ft. from the Canal bank. It will be about 700ft. in length by 200ft. in width, exclusive of annexes which project here and there at the back or north side. The character of the design partakes of the French Renaissance; while here and there, as in the towers flanking the principal entrance and at the corner domes, several features of a Moorish character are introduced. The main block contains, in addition to space for exhibits, dining and refreshment rooms and a concert room, 200ft. by 100ft. The general courts are 50ft. wide, and the total floor-space of this block extends to 177,000sq.ft. On the outer side of a railway bridge and promenade will be the Machinery Hall, a building nearly 700ft. by 150ft., providing a floor space of 99,600sq.ft., and on the north side will be the boiler annexe.

FAIRFORD.—The work of restoring the roof of the parish church of St. Mary, Fairford, and preserving the famous windows which, while forming its chief feature, at the same time constitute a unique national treasure, is proceeding steadily. The preparation of the plans was intrusted to the diocesan architect, Mr. Waller, and the restoration of the roof is being executed

by Mr. W. H. James, builder, of Cirencester; while the operations necessary for preserving the beautiful windows are in the hands of Messrs. Lavers, Westlake, and Co., of London. A workshop is provided in Fairford for Messrs. Lavers and Westlake's men, so that the windows are re-leaded on the spot, thus avoiding the risk of a journey to London and back. No "restoration" of the glass is attempted, it being rightly deemed that sufficient injury has been already wrought by previous efforts in that direction Where there are portions of the painted glass missing, the common glass covered with white-wash which previously filled the hole is removed, and replaced by stained glass of a sober neutral tint harmonising with the prevailing colour of the window. Nor is any attempt being made to clean the glass. It is handled as little as possible, the lichen growing on the interior surface is undisturbed, and thus the delicate enamel is not injured. All that is being done, in addition to the re-leading, is to correct any obvious errors of arrangement. The restoration of the roof of the nave is completed. The cost of the undertaking has been estimated at £3,000.

Hornsey New Parish Church.—The Bishop of London will consecrate to-morrow morning this church, accommodating 1,250 persons, which has just been erected. The first stone was laid in June of last year. Exclusive of the tower, the spire, and west front, which it is not intended to proceed with at present, the church, with organ, has cost a sum of £15,000, towards which nearly £14,000 has already been subscribed. The pulpit has been erected by parishioners and friends as a memorial to Canon and Mrs. Harvey, the former of whom for upwards of half a century was the rector. The building, which is of Ancaster stone, the style of architecture being Perpendicular, has been erected by Messrs. Rudd and Son, of Grantham.

Iochdar, South Uist.—A new church at Iochdar, in the Hebrides, was opened on Sunday week. The church will accommodate 150 people. It is Gothic in character, and is plainly finished inside with stained wood and seated with forms and open benches. The pulpit is placed on a raised platform at one end, and the roof is open up to the ridge. The windows are filled in with tinted glass in various shades. Externally the building has a belfry of wood, in which it is proposed to put a bell, which will be a novelty in the district. The building has been carried out under the direct supervision of the architect, Mr. D. Mackintosh, Oban. Mr. Dugald MacTavish, of Loch Maddy, was the contractor.

Johannesburg, Transvaal.—The foundation stone of the first permanent English church in this wonderful town, St. Mary-the-Less, Leppe Township, was laid on the 10th of September last. Mrs. Darragh, wife to the mission priest, performed the ceremony in the presence of the Lord Bishop of Pretoria, the Ven. Archdeacon of Kimberley, and a goodly company, and she was presented with a silver trowel by the architect, John W. Alexander, A.R.I.B.A., late diocesan surveyor for York.

Leeds.—The new Central High Grade School, erected for the School Board, was opened on Monday. The building has an area of 1,342 square yards, and has frontages to three streets. It is Classic in style, with pilasters having Ionic caps, two stories in height, at intervals along the fronts. The walls are of brick; the pilasters, capitals, mouldings, cornices, sills, and mullions of sandstone. The cost has been for site, £10,213 18s., and for buildings, fittings, &c., £28,189, making a gross outlay of £38,402 18s. There is accommodation for 2,500 pupils. On the ground floor are girls' and boys' dining-rooms, kitchen, gymnasium, 80ft. by 40ft., and 20ft. in height, rooms for deaf and dumb children, and caretaker's apartments. The boys are placed on the first floor, and the girls on that above, the planning being alike in both cases. There are ten class-rooms, four being arranged for 80 pupils each, and the other six for 72 each. All are fitted with Illingworth and Ingham's dual pitch-pine desks. On the third floor are the chemical laboratory, 80ft. by 30ft., and lighted by 28 windows; chemical lecture room, seated for 150 pupils, and a series of art rooms; and on the flat roofs are playground, laid with asphalte on concrete, and protected by a parapet 8ft. high. Mr. James Wood was the contractor for masonry, brickwork, carpentry, joinery, and flat roof, and Messrs. Taylor and Parsons for rolled iron joisting, stair railing, and palisading. The architects were Messrs. Kelly and Birchall. The construction of the building has throughout been under the personal supervision of Mr. Wm. Landless, architect to the Leeds School Board.

London School Board.—At the meeting of this board held on the 24th Oct., Mr. Roston Bourke moved to rescind a former resolution of the board, and to resolve that tenders be obtained both for general repairs and painting, based upon schedules of prices renewable at the end of each two years, and that firms willing to carry out the work be appointed for divisions or groups of schools; that sub-letting be not allowed. Mr. John Lobb, who seconded the motion, said the ratepayers had been fleeced out of hundreds of thousands of pounds in the building department of the board's work. He thought it was most unfair that only 21 out of the large number of builders in London should have a share of the Board's work. Thirteen builders had received no fewer than 337 contracts, and 411 contracts had been in the hands of 21 builders out of 1,500 in London. Sir E. H. Currie said he was perfectly satisfied that what was called the open system of tendering was not for the interest of anybody. The system by which they obtained the most work was a limited competition, giving every respectable builder in London an opportunity of coming and proving his case to the satisfaction of the committee who were charged with the responsibility, and he thought if that was done at the present moment they would get good work, and no respectable builder would have any reason for objecting to it. After considerable discussion, the first portion of the resolution was negatived by 37 to 5. The second portion was negatived by 29 to 14. The further discussion was adjourned.

Ludlow.—The new Market Hall in this town has recently been formally opened. It has been built from plans by Mr. H. A. Cheers, of Twickenham, selected in competition, and has been built, at a cost of £5,800, by Mr. Richard Price, of Shrewsbury. The hall occupies the centre of the Castle-square. It is a two-story edifice of red brick with white stone facings, cornices, and dressings. The roof is high in its pitch, and is of green slate, with red ridge tile capping. In style it differs widely from all other architectural features of note in Ludlow, being Queen Anne in character. The new hall forms a rectangle of 150ft. by 45ft., and covers an area of 6,750sq.ft., occupying about double the superficial area of the old building which it replaces. On the ground floor, or market space, there are four entrances, 12ft. wide, one in the centre of each front. The market space is 95ft. by 40ft., exclusive of approaches. The floor is paved with Seysell asphalte on concrete foundation, and the light obtained by arched windows, 10ft. 6in. wide, seven in each side, glazed with muffled glass. A row of six columns, 14ft. apart, support centrally the beams carrying the floor over. A market inspector's office and latrines are provided at the east end, also a surveyor's office, and at the west end is the police-station, a committee-room, and a kitchen. The public hall, or Corn Exchange, is on the first floor, with council chamber *en suite* at the platform end. The hall has a panelled Lincrusta Walton frieze, dado, and panelled ceiling. The assembly-room itself is the same size as market space below—95ft. by 40ft., inclusive of platform. The ceiling of this fine room is semicircular, divided into panels by moulded wood ribs. The council chamber is 35ft. by 25ft., having its own separate entrance, and a stone staircase approach. The height of the great hall will be 32ft. to ceiling, and the total height of building from ground line to ridge of roof 60ft., to flèche, 90ft.

The memorial stone of the new church for St. James's parish, Westend, Southampton, was laid on Monday week. The old church was never completed, the tower being left in an unfinished state, and a larger building, and one more suited to the requirements of Divine worship, was needed. The new church is being built by Mr. S. C. Parmenter, of Braintree, Essex, from the designs of Sir Arthur Blomfield, of Montagu-square, London. The style is Early Perpendicular, and the materials are red brick and concrete, with dressings outside of Leicestershire stone, and inside of Bath stone. Exclusive of the tower, the estimated cost is £6,600. The first section, now being proceeded with, includes the chancel (35ft. by 24ft.), two vestries, and organ chamber, and will cost £3,000.

SCHOOLS OF ART.

Royal Female School of Art.—The annual exhibition of the work of the students of the above school was opened on Friday at 43, Queen-square, Bloomsbury. The following are the winners of the chief scholarships this year:—The Queen's, of the value of £60 per annum, is awarded to Miss E. M. Flack; the Clothworkers', of £30, to Miss E. R. Horton; the Atkinson, of £25, to Miss E. Harwood; the Duchess of Westminster's, of £20, to Miss K. Turner; the Brightwen's, of £10, to Miss E. Cornish; and the two national scholarships (Gilchrist), of £50 per annum, for first and second year students respectively, to Miss M. Hodges and Miss J. Kirkpatrick. Miss Harwood, the Atkinson Scholar, takes the Queen's gold medal, as well as a national silver medal, for a chalk drawing of the Venus of Milo. Miss Flack gains a national bronze medal for a chalk study of hands from life; Miss Gavin another bronze medal for a design for lace flounces; Miss C. M. Kitson a bronze medal for a chalk drawing of hands from life; and Miss B. Norris a bronze medal for a chalk drawing of the Venus of Milo. Miss K. Cornish obtains a Queen's prize for a water-colour group of books and a mandoline. Five other ladies also take Queen's prizes, and some 33 or 34 win third grade prizes. The prizes have been all awarded by the Art Visitor, Mr. E. J. Poynter, R.A. The school building itself has had considerable improvements, carried out under the direction of Mr. Ernest Turner.

CHIPS.

The will of the late John Gregory Crace, the veteran art decorator, has been proved, with a personalty exceeding £84,000.

A Salvation Army "citadel" in Market-terrace, Crewe, was opened on the 24th ult. The building has been adapted into amphitheatre form from an old chapel from plans by Mr. J. W. Dunford, of London, and seats 1,200 persons.

The London and North-Western and Great Western Joint Committee have commenced an important extension of Chester General Railway Station, involving an expenditure of £120,000. The alterations include a new double set of rails which will effect a complete severance of the up and down main-line traffic, the construction of an island platform 1,100ft. by 60ft., two overhead bridges, and the erection of dining-rooms, cloakrooms, and offices.

On Sunday night damage to the extent of £2,500 was caused by a fire at the extensive saw-mills occupied by Messrs. Archibald Hood and Co., Polmadie, on the south side of Glasgow.

Mr. J. T. Harrison, one of the inspectors of the Local Government Board, held an inquiry at Warrington Town-hall on the 24th ult. into an application made by the town council for sanction to borrow £17,297 for the purposes of street improvements, and £7,000 for making additions and alterations at the depôts. The town clerk (Mr. W. H. Brook) said that the first sum of £17,297 had reference to the cost of carrying out the improvement in Bridge-street, by widening the thoroughfare. The gross cost of this undertaking had been £30,953, and the net cost £17,297, being an excess of something like £5,000 over the estimate.

Mr. John Benham Parker, a surveyor, aged 40, of Netley-street, Paddington, was summoned to the Marylebone Police-court, on Monday, charged with causing an obstruction in Earl-street, Edgware-road, by delivering a speech from a chair on Sunday evening. He was bound over to keep the peace for two months, but on the following morning appeared before the same magistrate, charged with a repetition of the offence, and was then fined 40s.

The first annual meeting of the registered plumbers within the counties of Aberdeen, Banff, and Kincardine was held on Saturday night in Gordon's College, Aberdeen. Office-bearers were elected for the ensuing year, and addresses were given on the advantages of technical training by Professor Matthew Hay, Mr. Esselmont, M.P., Lord Provost Henderson, Rev. Dr. Ogilvie, and Mr. William Pyper, of Hillhead.

The Mayor of St. Helen's laid on Monday the foundation stone of public baths for the borough, which will cost £9,500. The building will consist of gentlemen's first-class swimming-bath, 100ft. by 30ft., with 50 dressing boxes and gallery above. The bath will slope from 3½ft. to 6½ft., and will contain about 65,000 gallons of water. A ladies' swimming-bath 48ft. by 24ft., will slope from 3ft. to 5ft., and be provided with 27 boxes. There will also be nine first-class and 24 second-class gentlemen's baths, and half-a-dozen ladies' baths will be provided. The baths are being erected from plans prepared by Mr. J. C. Broom, borough surveyor.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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A STUDENT. (1. From the particulars you send us and plan, we hardly think it safe to put a cistern weighing three tons resting on two walls of 9in. thick 19ft. high; the cross wall is weakened by the doors at the junction, and cannot be depended on to assist the outer wall. If the walls between the openings are well bonded, and a good template placed under each end of the girder, so as to distribute the bearing, there would be perhaps less risk of settlement. The tendency of the weight would be to drag on the outer wall, where a pier 14in. thick ought to be placed. 2. A gable end 30ft. high in two half-brick thicknesses, tied together, would not be safe. The wall ought to be 16in. thick, a 9in. and a 4½ thicknesses tied together.)—E. H. B. (We will bear your request in mind. The BUILDING NEWS has dealt largely with the subject of Portland cement.)

RECEIVED.—J. H. M.—H. S. and F.—C. of S.—G. W.—G. B. and L.—D. and D.—W. P. B.

"BUILDING NEWS" DESIGNING CLUB.

ZODIAC. (We most carefully compared the relative merits of your work with the designs by "Unitas," and as already stated, you were nearly a tie with him, but not quite. He always worked out his designs more thoroughly than you did. Seeing you were so nearly equal to him on other points in the competition, however, we singled you out for Hon. Mention.)—W. M. LEWIS. (Will you and others read the rules as given last week? There are no fees, or it would have been so stated.)—MIKADO, Warrington. (You may get lights for the doctor's house from the sides; but remember adjoining houses which may be built up to the boundary line. Yes, a passage at the side into back garden is essential.)—WALLABY, Edinburgh. (See last answer. The lights at side, if any, must not occur in a party-wall, but may be obtained if the wall is within the 45ft. frontage.)—G. G. S., Bolton. (Certainly. See analysis of subjects given of last session's work in last week's BUILDING NEWS.)—ZENO. (Variety, yes. See last reply.)—E. S. THOMPSON. (See above answers.)—T. A. COOK. (Card received.)

Correspondence.

ELLIS TO THE RESCUE!

To the Editor of the BUILDING NEWS.

SIR,—With regard to Mr. Ellis's assertion in the BUILDING NEWS that "the windows at Beverley, Worcester, and Doncaster Tower are there treated like the south transept of St. Alban's," I flatly deny that his statement is true, and I suppose in such matters an architect's word is as good as a lawyer's—if not a little better. In order to make assurance doubly sure, I wrote respecting the Doncaster windows to the gentleman who was most likely, I thought, to know, and he says in reply—"There is nothing here at all parallel to the absurdity perpetrated at St. Alban's." I wrote to an architect and antiquarian at Worcester about the cathedral, and he says—"As regards Worcester Cathedral, there is no examples of so shameful a sham or conceit (or *de*ceit) as that shown in your sketch, I am thankful to say." As regards Beverley Minster, I referred to an architect who has just returned from there, having spent a month in that beautiful church sketching; he says—"With regard to the Beverley question, I can inform you that I have seen *nothing* of the kind as done by Lord G. at St. Alban's, and cannot see what is meant by the excuse."

Lord G.'s ambition in the south transept windows appears to have been the accomplishment of something big, oblivious of the artistic law that size *per se* is of little value. If he had stopped the windows at the height they appear in the interior, and made the upper portions a separate design, it would have been well, thus obtaining constructional propriety and more diversity—two ideas instead of one. I would advise him to amend his work while he can, or certainly it will be done for him. He lost a good opportunity for the improvement of St. Alban's in the alteration of the roof. It was advisable to keep the old flat ceiling for antiquity sake; but if its preservation was not possible, the opportunity—having a high-pitched roof over—might have been taken to put groining instead of another flat ceiling. Of course, as the walls were weak, the groining would be of wood—justifiable under the circumstances; thus much additional height would have been gained in the interior, and a beautiful finish instead of an ugly one, as now. Nothing equals the beauty of groining.

Your new correspondent, Mr. Burge, is greatly in error in supposing that time, which, as your leading article says, "has toned down the west front," will be able to effect any improvement of the transepts. Mr. B. evidently knows not the architectural specialties of the case. There are many degrees of badness—the faults of the west end are as nothing to the unmitigated worthlessness of the transepts. In the first work Lord G. appears to have had assistance from his draughtsman or some other person; but in the transepts he seems to have trusted to himself alone, and perhaps made his own drawings, hence the poverty of design and perverse mal-construction exhibited there. The only thing that time can do as improvement is *destruction*, but that will not be left to "time's effacing fingers." I live in the full assurance of hope that Lord G.'s tenure of power will soon end, and that when wiser counsels prevail his work will be overhauled, and by architectural judgment things made more *comme-faut*. Doubtless Lord Grim. will then look grim indeed.—I am, &c., M.

MR. HEMS.

SIR,—I must again repeat that I never heard of Mr. Hems' son's existence till I saw it mentioned in the "B. N." Even in a private and confidential letter to him, written at his own request, I did not accuse his son in this matter; and I am glad to find that (although the circumstance alluded to occurred) none of the Hems family were in any way implicated in it. Mr. Hems, jun., according to his testimonials, is a good young man, and I hope inherits the paternal modesty of this modern Pheidias as well.

Mr. Harry Hems glibly talks of libels, and yet coolly reiterates the nine statements about me which I mentioned in the "B. N." of 18th inst. Every one of these nine assertions is untrue, and Mr. Hems, for all his bounce, knows that anyone who uttered them on oath would have to take the consequences of libel and perjury, if he attributed any or all of them to me.

Mr. Hems is welcome to my name—"Ars" is much easier to write; and, except a few persons like himself, who have something to gain by notoriety, every writer in this controversy has been anonymous—from "One Who Wants to Know"—the first, who is probably identical, or connected, with the last—himself, as the first seems to be the only one who praised the screen statuary. I have pretty well established, almost single-handed, all I set myself to do—no one has effectually replied to me; and my remarks have necessarily been discursive, as other people have wandered from the subject.

I am happily not the only one to "vilify"—that is, tell the truth about "the living and the dead." In last week's "B. N." Dr. Lee deplores the destruction of Saxon and Norman remains at Chesham during the last restoration under Sir G. Scott. And this week's *Church Times*, describing the new chapel at Clumber, mentions that the old one was built by a local architect under the supervision of Sir G. Scott, but could not be used, owing to the foundations giving way.

As memories are short, I may recapitulate the St. Alban's story: In above 30 years, up to 1880, no more than £20,000 could be raised for the Abbey. Since that date Lord G. has spent £80,000 on it. No wonder the attempted agitation by Mr. Gough in the *Guardian* died of inanition.

And now, Sir, as I am going some thousand miles from home, I hope Harry Hems will let me alone, and confine himself to the usual weekly advertising of any job he may be intrusted with.—I am, &c., W. H. M. ELLIS.

Oxford and Cambridge Club, S.W., 29th Oct.

P.S.—I may add that for several years I have visited St. Alban's Abbey at least half a dozen times yearly, and knew it long before Sir G. Scott took it in hand.

ST. ALBAN'S ABBEY.

SIR,—I have not had time to follow the correspondence going on at home on the subject of Lord Grimthorpe's enormities; but, from the little I have seen of the same and Lord G.'s letter in your issue of August 30th, it appears to be of a personal character, very nearly approaching to what is commonly called "Billingsgate."

I have a painful recollection of a visit to St. Alban's when staying near Cambridge a few years back, and of subsequently seeing views and photographs of the so-called "restoration" as it has proceeded, and I am at a loss to understand how anyone could have allowed, or can still allow, Lord Grimthorpe to undertake work for which he has again and again proved himself utterly unfitted. In this golden part of the world we know pretty well what money can do; but I trust the "St. Alban's Restoration" case is unique in the whole history of the world as showing the power which a long purse and bare-faced impudence can wield.

In the past it has been said that the day will come when Englishmen—*i.e.*, those who are political—will curse the name of Gladstone, and I shall be much mistaken if those who are artistic do not, at a time not far distant, in bitterness of soul curse the name of Grimthorpe, and feel what fools they were not to prevent his acts of violence, even at the risk of using counter-violence to prevent him.

There is an instrument of torture frequently used by the Boer of the Transvaal in punishing his black and coloured servants called a "Sjambock." Any strong-armed reader of your paper, who does not mind appearing in the police-court, can receive one of these nice strips of hippopotamus hide by applying to me and giving me the assurance that he will use it without mercy upon the back of Lord Grimthorpe, and I will also gladly defray part of the fine in which he may be mulcted by the magistrate. I make this suggestion because it appears to me that nothing short of a good "sjambocking" will show this said personage that he has by act and word carried his insolence too far for the endurance of those who, *in the interests of art*, and not of their own pockets, as he so impudently suggests, protest, and will to the end protest, against St. Alban's Abbey being left at his ruthless mercy.—I am, &c.,

JOHN W. ALEXANDER, A.R.I.B.A.

Box 269, Johannesburg, S.A.R., Oct. 4.

[This sort of "argument" is really rubbish, and surely beneath the dignity of a member of the Royal Institute of British Architects. Lord Grimthorpe's assailants, however, have by no means a monopoly of strong language. We have had to omit one or two words from Mr. Ellis's letter which were really most objectionable, and we think it is nearly time all correspondents stopped writing if they cannot discuss the restoration of St. Alban's without dragging in Mr. Hems's relations, "Sjambocks," and other interesting but perfectly irrelevant matters. It is not a very plucky thing, after all, to advise other people to break the peace, all the way from South Africa!—ED. "B. N."]

"AN ARCHITECT'S DIFFICULTIES."

SIR,—On receiving instructions to proceed with a small alteration work, I wrote for tenders to contractors whom I thought likely for the class of work required, in the ordinary way. After tenders came in, the employer wished for further tenders for the joiners' work, which I told him was unusual to obtain and unfair to those who had previously tendered. However, he would have another lot, and after all let the work to an "outsider," who undertook to do the same at about half the amount of those who had previously tendered. The accepted man eventually "shunted" leaving the work half-finished; although he had received weekly "subs." from his employer, amounting to about the sum he should have completed the contract for.

As to the mason, my client, during the progress of contract, set another man on to put in a staircase window, &c., who had previously been turned away by the contractor; and my client afterwards dismissed the man because he failed to set "a fixture," which the contractor's bricklayer, or "setter," had started to do, but left, on the proprietor interfering. The accepted plasterer got "put out" by the proprietor by having a man "put in" (after the principal work was done) to make good after other trades, and it came to my knowledge that the interloper informed my employer that he would have tendered at first, but I would not give him a chance, having another in view, which was a direct falsehood (evidently to gain his own ends); the fact of the matter being that he was unknown to me, and came to my office the afternoon when tenders were being received, and said the job was mentioned to him by one of the joiners estimating. He wished to tender; but was told it was too late. I asked him to leave his address, in case of having similar work to let. I found on inquiry that he had "failed" shortly before coming to me, so my surprise was great on finding he had got "foothold," under the circumstances, in finishing the work, and had also done me an injury. Other minor annoyances have had to be borne; but perhaps the foregoing will be sufficient to mention. I shall be glad to learn whether my client was justified in proceeding as he did—he evidently thinking he had a right to do as he liked so long as he paid for it; but his method was not only vexatious to the contractors—it was more so to myself as architect. In the first instance, I did not wish to have a "boil over," as he said he had other work for me; but at last I got jaded with his vagaries. The work has taken three times the period to complete it would have done in the ordinary course; consequently extra time and trouble have been imposed upon me, and there is litigation looming with the contractors. Have I any redress, as I do not suppose my employer will expect to pay anything beyond the usual commission, and I may yet be called upon to clear up contractor's accounts?—I am, &c., TOLOP.

The death is announced, at the early age of 43 years, of Mr. Arthur Stocks, R.I., son of Mr. Lumb Stocks, R.A. On leaving school he was instructed for some time by his father, in his profession of line engraving, but, showing an aptitude for painting, the son entered the schools of the Royal Academy, then under the keepership of Charles Landseer, profiting greatly thereby by the instruction received there, and taking some of the medals. He produced an original work, which was exhibited on "the line" at the Academy in 1872, entitled a "Review at Chelsea." His *genre* works have each year since then been hung at Burlington House, and in the last Academy exhibition he showed "The Sands of Time." and "A Friend of mine, Grandfather," bought by the Art Union of London.

A parish room, 42ft. long, 21ft. wide, and 19ft. 6in. high, has just been built from designs by Mr. Octavius Ralling, M.S.A., of Exeter, in the grounds of Clist Hydon Rectory, for the rector, Rev. Donald M. Hughes. The room will be used for parish meetings, lectures, concerts, &c., and supplies a want, as there is no room in the parish suitable for the purpose. The lighting is effected by gas and incandescent electrical lamps, arranged and for the most part laid on by the rector himself, who, in addition to being a good parish priest, is also a skilled engineer. The cost has been borne entirely by the rector. The contractor was Mr. Elwin Harris, of Clist Hydon.

The new wing of the Free Library at Poole was formally opened on Oct 24th. It consists of a reference department on the ground floor, and a room for the School of Art above. Mr. R. T. Habgood was the contractor.

Intercommunication.

QUESTIONS.

[10131.]—**Contractor's Liability.**—The following clause appears in an architect's specification:—"Make good and be responsible for all damage done [that may occur] to the adjoining buildings by reason of the carelessness or negligence of the contractor's workmen [during the carrying out of the work]." This was altered as shown in brackets, before the contract was signed, presumably because of the difficulty of proving carelessness or negligence in the event of damage. After the building was erected, some cottages adjoining sunk by reason of the weight of the new building. The owners of the cottages sued the proprietor of the new building, who in his turn, holds that the contractors are liable under the above clause, although his architect says the clause only refers to damage over which the contractors had control. Can any of your readers kindly state the legal view of the case, or can you tell us if the contractors are liable for damage and how far, and much oblige—J.

[10132.]—**Applied Mechanics.**—What is the best elementary book on applied mechanics for an architectural student?—E. G. P.

[10133.]—**Boards on Party Fence.**—Two houses adjoining each other, one the property of A., and one of B., have a party iron fence dividing the premises. A. fixed boards (more than 30 years ago) on B.'s side of the fence. Can B. now legally remove the boards?—QUERY.

[10134.]—**Billiard-room over Stable.**—Will some reader kindly suggest the best method of curing the strong scent of ammonia that rises into a billiard-room built over a stable. The nuisance is only noticed after the gas is lit. I have suggested a reconstruction of the drainage of the stables, but the proprietor objects on the ground of expense. Can any reader suggest some non-absorbent material laid between or over the joists to effectually stop the nuisance?—METREUR.

[10135.]—**Specification Writing.**—Is it better to describe digging by itself when in connection with walls, or would it not be better to describe it at the same time the construction of walling is specified, so as to have all items together under heading of walling?—DOUBTFUL.

[10136.]—**Plaster Cornices.**—In oiling plaster cornices and enrichments, to prevent their becoming effaced by whitewashing, what kind of oil should used, and how many coats applied?—TEACHABLE.

[10137.]—**London Buildings.**—May I ask some reader to inform me who were the architects for the following works?—1. Apsley House, Hyde Park-corner. 2. Spurgeon's Tabernacle. 3. St. Leonard's Church, St. Leonard's-street, City. 4. Gresham-buildings. 5. Mansions, Lancaster-gate (built by Mr. Kelk). 6. Albert-mansions, Queen Victoria-street, City.—F. E. R.

[10138.]—**Areas of Manchester Buildings.**—Can anyone inform me the area of block plan (without outbuildings, footpaths, &c.) of the following buildings, all in Manchester?—Central Station, Town Hall, Royal Exchange, Free Trade Hall, General Post Office. If they could conveniently give length and depth of each it would be interesting, though not essentially necessary. —CHALK LINE.

REPLIES.

[10111.]—**Cast-Iron Pillars.**—I regret that an error of mine should have vexed "Rex," and I cannot atone by giving the information this week, as I have mislaid my notes; but will try to do so next week.—H. L.

[10114.]—**Floor Stiffening**—I agree with "H. L." that herringbone strutting is better done before floor-boards are laid; but I have to deal with a contractor who thinks otherwise, as he says he has always been accustomed to do the strutting along with the boarding, and found it better for the workmen to execute the work, as the boarding served as scaffolding for getting to where the row of strutting had to be fixed.—SCHEMER.

[10116.]—**Copper Roofs.**—"Sunshine" had better leave the copper roof to the atmosphere. The greenish hue it assumes is the work of time and the moisture which contains acid.—TETA.

[10121.]—**Main Sewer.**—Sect. 23 of the Public Health Act gives power to local authority to require the owners of any houses to make a drain emptying into any sewer which is not more than 100ft. from the site of such houses. If the distance is greater, the authority can require a covered cesspool to be made, but not under any house. According to this section, the authority may, however, if they think a new sewer less costly, construct a sewer and call upon the owners of houses to use it, and apportion the expenses among them.—G. H. G.

[10124.]—**Prime Cost.**—As there was no reply to this query in the BUILDING NEWS for the 18th, I have been looking up back numbers, and find it stated in a letter by Mr. Thomas M. Rickman, F.S.A., that "prime cost required explanation, as to whether it was to be taken from the list price without trade allowances, without also discount for cash, and also whether it had to be increased by establishment charges, carriage, and fixing." The following clause to specifications and quantities I have found useful:—All provisions, whether of money or materials, are to be the exact amount stated, and subject to the direct orders of the architect, and to be expended or not, wholly or in part, as the case may be required by him, and to be deducted accordingly (wholly or in part as the case may be) if not required to be expended, without any claim or allowance for profit or loss by reason of such orders, beyond that included in the price of work performed, as allowed by the architect.—TOLOP.

[10129.]—**Spire.**—In reply to "Enquirer," I might answer with *Punch's* emphatic and celebrated monosyllable, "Don't." Possibly, however, "Enquirer" might want to know the reason, and that involves a history which, if you, Sir, do not mind, I will give. The ancient Greeks, with a subtile perception of beauty which we now can only wonder at, noticed that straight lines under some conditions appeared curved, and they, to obviate this, made the lines curved in order to appear straight. In respect of columns they perceived a slight concavity near the middle, and therefore gave a swelling or entasis as a corrective, but of so slight a nature that the eye could not detect a departure from straightness. The Romans adopted the custom, and in their coarse way exaggerated it. The Renaissance architects still further increased the bulging until it became in some cases positively ugly and ridiculous. The effect noticed by the Greeks seems to me to result from the eye regarding the column positively with the horizontal members top and bottom, to which it is united. These lines spreading on each side enlarge the column at the extremities in appearance, and so the idea of smallness is given to the column at its middle. In isolated columns this effect I do not think would be produced from the absence of entablature. There are two columns at the West End which illustrate this. The Duke of York's column has an entasis, and very bad it looks; the column resembles a roly-poly pudding. The Nelson Column has not, I think, any entasis, and does not need it. The Gothic architects happily knew nothing of Classical rules. They did not diminish their columns or use entasis anywhere; but I fancy that they had an idea that tall piers had a look of weakness at their middle, and they put the annulet there by way of correction, and it certainly has such effect. And now to bring the matter to its relationship with spires. The column when isolated does not, as I have said, need swelling, and still less so the spire; for in the rapid tapering of the boundary lines to the apex, if any departure from the straight were at all apparent, it seems to me the effect would be one of convexity, and that a curving in, not a swelling out, would be needed. But, apart from theory, it is certain that the Gothic men built their spires with straight lines, and therefore, "Enquirer" should do the same. I am aware that there are some old spires which show a curved and truncated outline; but this is the consequence of the builders beginning with a wrong angle, and finding when unfinished it was leading them too high: they simply "gathered in" and completed their work at a shorter elevation and with a very unpleasant appearance. As in such cases there is a curve, it may probably have originated the notion that there was entasis in all spires, and that the aforesaid cases were only imperfect specimens. Really, they are blunders. As "Enquirer" is not accustomed to spire work, he may not mind my telling him that his courses of stone should lie horizontally, and the spire walls be not too thick—9in. at base and 6in. at the top would be ample. If he can do without arches at angles of tower so much the better. Broach spires need no arches. Some people talk of arches as if they bound walls together and gave increased strength. It should always be borne in mind that the reverse is the case. An arch holds materials in a state of rebellion, so to speak—never at rest, and eager always for disruption.—M.

[10130.]—**Decayed Stone.**—If "C. W." wants to restore the sandstone, or reface it where decayed so as to be effectual, and without cutting away more than is bad, and also match the colour and texture of the stone, it can be done, and if he will advertise his address I will furnish the necessary information.—JAS. PULHAM.

CHIPS.

The new vicarage in the course of construction at Thornton-le-Street is approaching completion. Messrs. Demaine and Brierley, of York, are the architects, and the masonry and brickwork have been executed by Messrs. W. Jackson and Son, Thirsk; and the woodwork by Mr. W. Ruecroft. The building is Gothic in style.

On Saturday the Marquis of Lorne opened the Victoria Art Galleries at Dundee. The galleries have been built at a cost of £13,000, from the plans of Mr. William Alexander, city architect of Dundee. They are an addition to the Albert Memorial buildings, erected many years ago from designs by the late Sir Gilbert Scott, which have involved a total outlay of nearly £48,000.

Mr. P. W. Squire, the well-known chemist and photographer, of Oxford-street, doubts very much the alleged great danger to water-colours by the electric light, to which attention has been called by Mr. J. J. Hissey, as mentioned by us last week, p. 580. So far as sensitivised paper for photographic prints can be taken as a test, analogous experiments show, he says, that the brightest incandescent lamp is far weaker in its action than the most diffused daylight.

The name of Robert Evans, of Wimbledon, architect and surveyor, appears in Tuesday's list of receiving orders in the *Gazette*.

With the object of creating a Greater Manchester under one municipality the general purposes committee of the Manchester City Council have agreed to a report recommending an extension of the boundaries, which would include in the city the important suburban townships of Crumpsall, Newton Heath, Blackley, Moston, Clayton, Gorton, Kirkmanshulme, and Moss Side. The council has unanimously adopted the report, and added Failsworth and Stetford to the places to be included.

A monument, provided by subscription, is about to be erected over the grave of Mr. Henry Richard. It takes the form of a Gothic canopy in Portland stone, supported by eight columns of polished granite. On the front Mr. Physick, the sculptor, has introduced a medallion portrait in white marble, and on another panel are the dates of the chief events in Mr. Richard's life.

The committee of the Walker Art Gallery of Liverpool have purchased for that institution an excellent half-length portrait of the late Sir James Allanson Picton, F.S.A., painted by R. E. Morrison. It will be hung in the permanent collection.

LEGAL INTELLIGENCE.

A. Payne, District Surveyor of East Hackney (South) and North Bow v. G. W. Beale, Builder.—(Dalston Police Court, before Mr. Bros, Magistrate, Oct. 21. Neglect to Give Notice. Building Act, 1855, Sections 9, 38, and 41.)—Defendant had given notice by letter, August, 1888, of intention to extend the schoolroom of Hampden Baptist Chapel, South Hackney. This work was completed in the spring of 1889, the district surveyor's account sent in and paid. In September, 1889, the district surveyor discovered that new windows had been formed in some recesses in the chapel, and wrote to the defendant requesting notice and full particulars of the work, which, however, he declined to send; hence these proceedings for neglect to give notice. The defendant was represented by a solicitor, and maintained first that the works were covered by the original notice; and, secondly, that merely taking out the 9in. filling of a recess and inserting a window did not affect the structure, or was work of a nature requiring a notice. He called the minister of the chapel to show that the work was constantly going on; but this witness admitted, in cross-examination, that the order for these windows was not given till about July, 1889. Mr. Hamilton, an architect, gave evidence for the defence, and maintained that the work did not necessitate any alteration to the building. This witness, however, admitted that if the filling of the recesses were removed, it was necessary to ascertain that there was an arch over the part removed or to place one there, or the superincumbent wall would fall down. Also that the work could not be called a necessary repair under Section 9.—The magistrate, in giving judgment, decided that this could not be called a repair or exempt under Clause 9, but was work for which notice ought to be given. Also that it was not covered by the original notice for extending the schoolroom. The defendant was fined 20s., and costs.

Estate Agents' Commission.—Kirk v. Evans.—Mr. Baron Pollock, sitting in the Queen's Bench Division, heard this case on Monday without a jury. It was one of interest to estate agents and surveyors. The plaintiff, an estate agent in Mark-lane, E.C., was employed in April, 1885, to sell land for building purposes, belonging to the defendant, at Baker-street, Enfield. He found a purchaser in a Mr. Wright, who commenced operations, but never completed the building of 18 projected houses. After a correspondence the defendant paid some £18 in sums of £10 and £8 to the plaintiff in respect of his commission, and this action was brought in March, 1889, to recover £82, the balance of £100, the value of the commission alleged to have been earned. According to the plaintiff's case this was payable as soon as the agreement was signed by the parties; and the above sum was calulated on the basis of one year's maximum ground-rent. But the defendant said that no such commission was due until the land had been covered and ground-rent had been created for his benefit. There was a strong conflict of evidence on the point as to which custom prevailed, and architects, surveyors, and engineers were called on either side in support of their respective contentions. His lordship said the case depended on which custom had been established of those attempted to be set up. He came to his conclusion not without some difficulty; but regard must be had to the general rule that commission was earned when the contract was obtained. This was the general rule of commercial contracts, and was quite apart from the solvency of the purchaser or his power to perform his contract. It did not become due by merely getting a man to sign a paper, but getting the man to do something whereby the landlord was enabled to earn his rent—that is, building the houses. He said this with the full belief that the plaintiff's witnesses had given their evidence honestly. On the whole he thought the custom was to pay the commission in these agreements not when the agreement was signed by the parties, but when leases were granted and ground-rent accrued after the houses were built. In that view, therefore, there would be a verdict and judgment for the defendant, with costs.

Is Notice Necessary for Rebuilding Portions of an External Wall and Chimney Stacks?—On October 29, 1889, Mr. Banister Fletcher, the district surveyor for West Newington and part of Lambeth, summoned Messrs. Briant and Son, of 200, Kennington Park-road, the builders, under the Metropolitan Building Act, 1855, 18 and 19 Vic. cap. 122, section 41, for refusing to give notice for rebuilding the upper portion of the external wall and chimney stacks, which had been taken down under a dangerous-structure notice from the London County Council, at No. 8, Crampton-street, Newington Butts. In the evidence it was stated that the quantity of wall rebuilt was about 22ft. long and about 3ft. 6in. in height, and, in addition, two chimney stacks, one containing three flues and the other two flues, and the district surveyor called attention to the important fact that in the rebuilding a portion of the work was contrary to the Act, and also that the work might be contrary to the Act in thirteen other respects, and that when he received the notice asked for, the examination would be made by him. The builders were represented by counsel and solicitor, the former contending that the work was exempt under section 9 of the Metropolitan Buildings Act, 1855, and that the case of "Badger v. Denn" could not apply to the present case, because that case was based upon an alteration having been made, and the decision of the Court was "that no public good could result from notice being given," and he agreed that in that case there would have been no public advantage, because none of the work—which consisted of making good decayed brickwork round a doorway—could have been done at that time contrary to the Act, whereas in the present case it was of the greatest importance that the work should be superintended by the district surveyor, because, if not, the building might be improperly done, as regards the wall in eight distinct breaches of the Act, and as to the chimneys in six. He called attention to a similar case in which Mr. Hannay had decided that notice must be given for rebuilding, and also to a decision of Mr. Chance in this Court over-ruling Mr. Ellison's. The decision was: "That rebuilding one foot in height of chimney-stacks was work which came within the provisions of the Building Act, and that notice was consequently necessary." Mr. R. J. Biron, Q.C., the sitting magistrate, decided that if no alteration had been made the work was exempt. He refused, however, the application to give costs against the district surveyor, and agreed to grant the district surveyor a case, as he desired to go to the Superior Courts.

Re T. James.—(Before Mr. Wreford, Assistant Receiver.)—A first meeting was held on Wednesday under the failure of Thomas James, of Northwold Buildings, Stoke Newington, and Amhurst Park, Stamford Hill, builder, whose statement of affairs shows gross liabilities £38,653, of which £35,349 are stated to be fully secured, and assets £285. Resolutions were passed for the acceptance of a composition of 2s. 6d. in the pound.

WATER SUPPLY AND SANITARY MATTERS.

Cheltenham.—At a meeting of the Cheltenham Town Council, on Friday, Mr. Lawrence (chairman of the special committee appointed to inquire into certain allegations which had been made against the Water Department) brought up the committee's report. Two matters only were dealt with—viz., firstly, the facts connected with the appointment of a clerk of the works at the water works which are in progress at Tewkesbury, and the alleged withholding or suppression of an application for that appointment received by the water-engineer (Mr. McLandsborough) from a Mr. Davis; and, secondly, the alleged improper withholding by the water-engineer of a letter of complaint against his department addressed by Mr. E. Wetherill to the "Municipal Commissioners of Cheltenham," and admittedly intended for the Town Council. The committee regretted that they could not accept the water-engineer's explanations as satisfactory. They found that Mr. McLandsborough's claim to consider Mr. Davis's letter as a personal one was not consistent with the fact that he did ultimately bring it before the Water Committee, though not till after Mr. Davis had left the town; and, as to Mr. Wetherill's letter of complaint to the Council, the committee considered the withholding of it from the Town Council was intentional, and the circumstances under which it was afterwards produced inexcusable. The committee added that they were of opinion the engineer had been guilty of a grave breach of duty in both the matters referred to them. The report continued, "Having regard to the facts stated in this report, and other matters brought before them, the committee are of opinion that there has been much friction between the ratepayers and the manager of the Water Department, which is not conducive to the interests of the town, and, considering also certain irregularities which the committee considered to have been carried on under Mr. McLandsborough's management, the committee are of opinion he should be called upon to resign." Alderman Sir Alexander Ramsay, Bart., seconded the adoption of the report.—An amendment was moved by the chairman of the Water Committee, to the effect that, in view of the present transitory state of the corporation water system from an intermittent to a constant supply, it was inexpedient to dispense with Mr. McLandsborough's services at the present time. This was seconded, but was negatived by 15 to 4, and the resolution for the adoption of the report carried. A letter was read from Mr. McLandsborough stating that he should, if necessary, take steps to defend his position and character.

Huddersfield.—The chairman of the Sanitary Committee of the Huddersfield Corporation, cut the first sod of the new sewage works at Deighton, on the 24th ult. The contract, which has been undertaken by Messrs. W. Radcliffe and Sons, of Huddersfield, for a sum of £40,000, including a new road, boundary and wharf-walls, a weigh-place, valve, alterations to the outfall, erection of store-room, a destructor-shed, a chimney 90 yards high, a main block of buildings to contain the steam-engines and other machinery in connection with the work of precipitation, 16 precipitation tanks, an effluent channel 730 yards long, and an iron bridge to the land, which has been obtained to increase the facilities for access. Mr. R. S. Dugdale, C.E., is the engineer.

The Housing of the Poor in Edinburgh.—The annual return of the sanitary work in Edinburgh of the Burgh Engineer's department, just issued, shows what has been done during the past year in connection with the house-to-house inspection of the poor districts of the city; the work of the Public Health Committee in dealing with uninhabitable and insanitary houses; the introduction of sanitary conveniences; the reconstruction and repair of the drainage and sanitary arrangements of dwelling-houses, and similar work. In connection with the question of the housing of the poor, the report states that of the total population of the city—viz., 266,900, there is an estimated population of 33,900 occupying houses of a rental under £5, and 86,300 occupying houses over £5 and under £10—a total of 120,200, of whom from 60,000 to 70,000 occupy houses of one apartment only. This report states that there is every reason to believe that a scheme of houses for the very poor, erected on model principles, but of cheap, though perfectly substantial materials, is quite practicable, and likely, under proper management, to yield a reasonable return. From the inquiries made by the committee into the sub-division and sub-letting of houses throughout the city, it has become evident that there is a demand for cheap houses, and that the sub-dividing process is in active operation in order to meet such demands. Such sub-division of houses has the effect of massing families unsuitably and inconveniently together under one roof, under the conditions where infectious diseases are readily propagated and contagion easily spread, thus perpetuating in other quarters the very evils which the committee are suppressing in the "slums." The grand remedy would be either that the operations of the Social Union should be increased and extended, or that a cheaper class of dwellings, suitable for the very poor, be provided, with adequate light, air, space, modern sanitary conveniences, &c., independent accesses, and thus sufficient means of isolation, and so provocative of an improved habit and tone of the occupant.

CHIPS.

New Board schools for 2,000 children are being built in Westoe-lane, South Shields, at a cost, including site, of £16,000. Mr. J. H. Morton, of that town, is the architect, and Mr. Robert Allison, of Whitburn, the contractor.

Alterations have been made to the Temperance Hall, Derby, embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

An industrial home and school at Coventry, built from plans by Mr. H. Quick, of that city, were opened last week by Lord Leigh.

A new Free Church at Hopemount, Inverbrothock, was opened on Wednesday week. It is Early English in style, and is seated in area and west gallery for 800 persons. Adjoining is a church hall accommodating 400 people. Mr. Rust, of Aberdeen, was the architect, and the outlay has been £3,000.

A new palace is being built at Drumcondra, near Dublin, for the R.C. primate of Ireland. It is Italian in style, and will be faced with red brick and limestone dressings, the plinth being of ashlar. Mr. W. Hague is the architect, and Messrs. W. Connolly and Son, of Dublin, are the builders.

A new Wesleyan mission chapel was opened in Skelgate, Ripon, on Friday. The building is Gothic in style, the plain brickwork being relieved by stringcourses. The interior accommodation is for about 140 persons. Plans for the structure were provided by Mr. J. H. Beck, of Ripon, under whose supervision the work has been carried out.

At a meeting of Manchester citizens, held on Tuesday, a resolution was passed in favour of erecting a statue to Mr. Bright's memory. Subscriptions were promised, and a committee was appointed.

The Bishop of Durham was presented on Tuesday with a silver pastoral staff. The presentation was made by the Earl of Durham. The staff is being made by Messrs. Carrington, and is very far from completion, most of its details being still in the rough, and some represented only by wax models.

Our Office Table.

During the past week Canon Greenwell has been occupied in opening barrows on the north-east of the Yorkshire Wolds, in the parish of Folkton and Hunmanby. On the east side of the barrows on Folkton Wold the remains of a child were found, together with three objects composed of hard wold chalk, and unlike anything ever found before. They are circular, and vary in size from 4in. to 6in. in height, and from 4in. to 7in. in diameter, weighing from 2½lb. to 7lb. They are entirely covered, except at the bottom, with a series of raised and incised lines forming patterns and ornamentations. One design occurring upon all consists of a series of dots, producing in a conventional form the human face. No such figure has hitherto been met with upon the pottery or other articles of the ancient British period. There were also seven burials of unburned bodies in the same mound, with which there was nothing associated, except the central one, which had a decorated drinking-cup. The last barrow excavated was 45ft. in diameter. It contained four bronze axes of the early form, without flanges or sockets, these being ornamented with short incised lines. They are of the type of axe which, hitherto, is the only one that has been associated with the burials of the Bronze period in Britain.

Another meeting of members of the London building trade was held on Tuesday evening at Anderton's Hotel, Fleet-street, for the purpose of considering the action to be taken by them in order to gain success for their contention that there should be "a perfectly equitable distribution of all the work necessary to the schools," and their "right to participate in the execution of such work." The attendance was small, and the business was chiefly confined to the consideration of a report setting forth the action of the School Board in relation to the subject of contracts, and the steps taken by the committee since the last meeting of members of the building trade. It was resolved that a letter should be sent to each member of the School Board, setting forth a statement with reference to the request made in the memorial presented on the 23rd Oct. It was also agreed that an effort should be made to obtain another interview with the Board, in order that they might, by rebutting statements and giving answers to questions, present their claims in a still clearer light.

We understand that on account of the continued rise in cost of raw materials and increase in wages, which have materially increased cost of manufacture, the Midland manufacturers of sanitary ware have unanimously agreed to lower discount on their list 5 per cent. on and after the 1st of November. We also understand that a new and revised list of prices for various patterns of chimney pots made by them will be issued on same date. Business generally in this branch of trade in the Midlands is very brisk, and many manufacturers have booked orders which will keep them fully employed for several months to come.

CHIPS.

A new schoolroom, to which a gymnasium is attached, connected with Stanley Congregational Church, Green-lane, Liverpool, was formally opened on Tuesday. The total cost has amounted to £2,000. The school has been erected by Messrs. Hughes and Stirling, from plans by Mr. R. P. de Ridé.

The foundation stones of a new Sunday school for the Methodist Free Church body were laid at Blucher-street, Barnsley, on the 24th Oct., on a site contiguous to the present chapel and school. The school will be built at a cost of about £2,000, from designs of Mr. H. Crawshaw, and will contain one large room, with balcony, to accommodate about 500 persons, meeting-room, and 15 classrooms.

Saturday in next week, the 9th inst., has been fixed as the date for the commencement of the legal duel between Lord Grimthorpe and Mr. H. Hucks Gibbs concerning who shall restore the Lady-chapel of St. Alban's Cathedral. The case will be heard by Mr. F. H. Jeune, Q.C., chancellor of the diocese, at his chambers in the Temple.

Mr. John Reid, late surveyor of the Edinburgh and Leith Gas Company, and till his death consulting engineer, died on the 23rd ult. With one exception he was the oldest gas engineer in Scotland. He was appointed to office in 1860, and retired from active life in 1878.

MEETINGS FOR THE ENSUING WEEK.

Monday.—Royal Academy Lectures in "Anatomy," No. 9, by J. Marshall, F.R.S. 8 p.m.
Royal Institute of British Architects. Opening address by the President, A. Waterhouse, R.A. 8 p.m.
Liverpool Architectural Society. "The Liverpool Building Act," by James Dod. 7 p.m.
Society of Engineers. "Modern Gas-Engines Practice," by Samuel Griffin. 7.30 p.m.
Clerks of Works Association. "Construction of Theatres," by W. Browne. 8 p.m.
Glasgow Architectural Association. "The Elizabethan Style," by Chas. Macintosh.
Manchester Architectural Association. Address by the President, J. H. Woodhouse.

Tuesday.—University College, Gower-street. Free Lecture on "Applied Art," No. 4, by H. Stannus. 5 p.m.
Sanitary Institute, "Power and Duties of Sanitary Inspectors," by J. F. J. Sykes, M.B. 8 p.m.

Thursday.—Builders' Benevolent Institution. Annual Dinner at Carpenters' Hall. 6 p.m.
Royal Archæological Institute. "The Great Sphinx of Egypt, with Some Account of the Spread of the Sphinx Idea in the Ancient World," by Mrs. Tirard; and "Sculptures of Oriental Designs at Bradwardine and Moccas," by the Rev. Greville I. Chester." 4 p.m.

Friday. — Sanitary Institute, "Nature of Nuisances," by J. F. J. Sykes, M.B. 8 p.m.

The parish church of St. Austell, Cornwall, was reopened on the 24th ult. after the insertion of five memorial stained-glass windows. Four of these were executed by Mr. E. R. Suffling, of London, the fifth by a foreign firm.

St. Peter's Church, Bayham-road, Tunbridge Wells, was reopened on Tuesday week after enlargement by the addition of a north aisle. Messrs. H. H. and E. Cronk were the architects, and Mr. E. Jarvis, also of Tunbridge Wells, was the builder. By the addition, 240 sittings were added to the church.

The Barnsley school board are about to build schools for 650 children in Agnes-road, from plans by Messrs. Senior and Clegg, of that town.

The National Gallery has been enriched by a work by Mierse Molinaer, one of the School of Haarlem, who died about 1668. It is entitled "Musical Pastime," and represents a lady and gentleman playing on mandolines and singing to their own accompaniments. In the background is a servant, and at the lady's feet lies a dog. The picture is numbered 1293, and has been purchased from the Clark bequest.

Pertinent Questions.—What is more comforting in cold and damp weather than GRANT'S MORELLA CHERRY BRANDY? What is more beneficial to the weak and aged than this wholesome tonic? What do sportsmen and travellers find more sustaining than a flask of the "Sportsman's Quality"? What is more disappointing, when asking for Grant's, to be put off with some inferior make? Sold everywhere.—T. GRANT and SONS, Maidstone, Makers of the Non-alcoholic Wine "Morella," and of the delicious Morella Marmalade. Sold by Grocers.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

Batley Carr.—For the erection of two dwelling-houses and shops in Town-street, Batley Carr. Quantities by the architects. Messrs. Page, Spencer, and Son, Batley Carr, architects:—

Accepted tenders:—
Masons:—Oldroyd, J. and T., Batley.
Joiners:—Richardson, J., and Sons, Staincliffe.
Plumber and glazier:—Shepley, J., Dewsbury.
Painter:—Lodge, J., Batley Carr.
Plasterer:—Parker, W., Heckmondwike.
Slater:—Hargreaves, G., Dewsbury.
Ironfounders:—James, W., and Sons, Dewsbury.

Bromley, Kent.—For the erection of a boundary wall in Beckenham-lane, for the Bromley School Board. Mr. H. S. Cregeen, surveyor:—

Lay, G. H.	£305	0	0
Woodhams, J. L.	290	0	0
Taylor, J., and Son	275	0	0
Podger, J...	275	0	0
Peill, E., and Sons	269	0	0
Crossley, T.	253	0	0
Satchell, C. (accepted)	250	0	0

Surveyor's estimate, £265 17s.

Chislehurst.—For the erection of six cottages at Chislehurst, for Messrs. T. Norfolk and Sons, brewers. Mr. T. Dinwiddy, architect:—

Otway, Chislehurst	£1,410	0	0
Hall, New Cross	1,124	0	0
Jerrard, Lewisham	1,092	0	0
Kennard Bros., Lewisham ...	1,080	0	0
Holloway, New Cross	1,078	0	0
Knight, Sidcup	1,047	0	0

Cubitt Town, E.—For the erection of a new school for 800 children on the site in Cubitt Town, Isle of Dogs, for the London School Board:—

Atherton and Latta	£18,744	0	0
Dove Bros.	15,888	0	0
Cubitt, W., and Co...	15,768	0	0
Grover, J., and Son	15,640	0	0
Patman and Fotheringham ...	15,477	0	0
Charteris, D.	14,675	0	0
Lawrance, E., and Son	14,578	0	0
Stephens, Bastow, & Co., Wandsworth (accepted)...	13,999	0	0

[(*a*) Cost of school buildings and closets, £9,617; (*b*) cost of tar pavement and playgrounds, £833; (*c*) cost of boundary walls and gates, £688; (*d*) cost of schoolkeeper's house, £561; (*e*) extra depth of foundations, £2,300; total, £13,999; cost per head of (*a*), £12 0s. 5d.; total cost per head, £17 9s. 11d.]

Dartford.—For new coach-houses, for the Bull Hotel. Mr. G. H. Tait, C.E., architect:—

Knight, T., Sidcup	£273	0	0
Hill, J., Gravesend	259	0	0
Hewitt, E., Dartford (accepted) ...	184	0	0

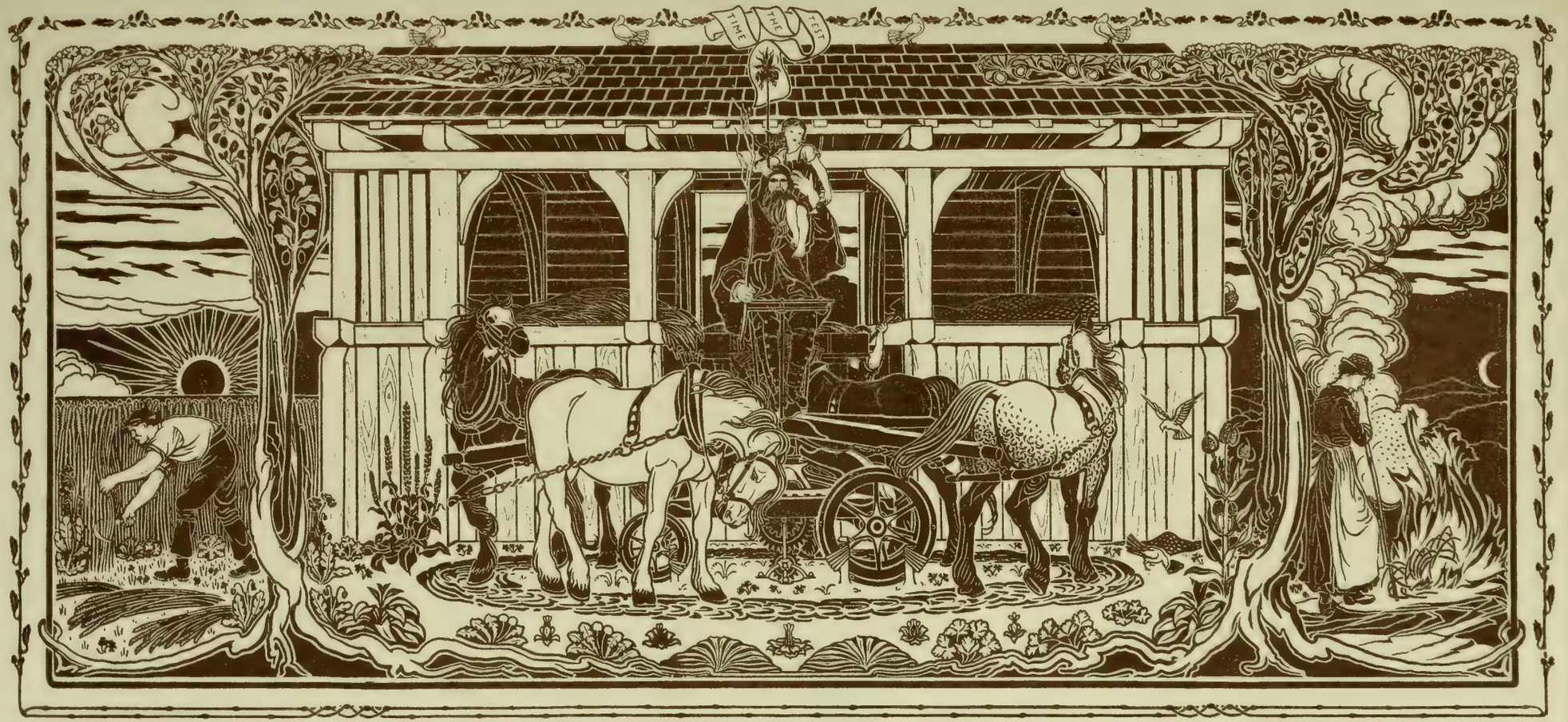
Deptford, S.E.—For the erection of a deaf and dumb centre on the Stanley-street site, Deptford, for the London School Board:—

Derry, J.	£2,214	0	0
Lathey Bros.	2,134	0	0
Holloway Bros.	2,096	0	0
Downs, W.	2,083	0	0
Dabbs, W. M.	1,967	0	0
Kirk and Randall	1,954	0	0

[(*a*) Cost of school buildings only, including closets, £1,489; (*b*) tar pavement and playgrounds, £139; (*c*) boundary walls and gates, £211; (*d*) extra w.c. accommodation for graded boys, £69; (*e*) extra depth of foundations, £46; total, £1,954.]



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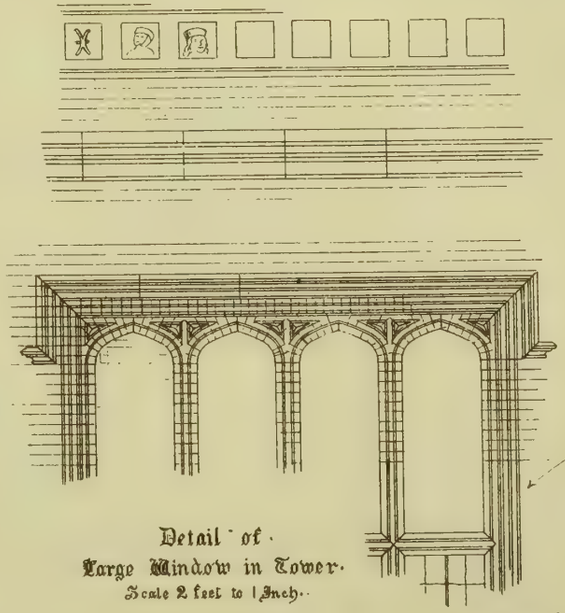


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ST PAUL · VENICE



Section A.B.



Detail of
Large Window in Tower.
Scale 2 feet to 1 Inch.



Jamb.
1 Quarter full Size.



Jamb
of window above
A.

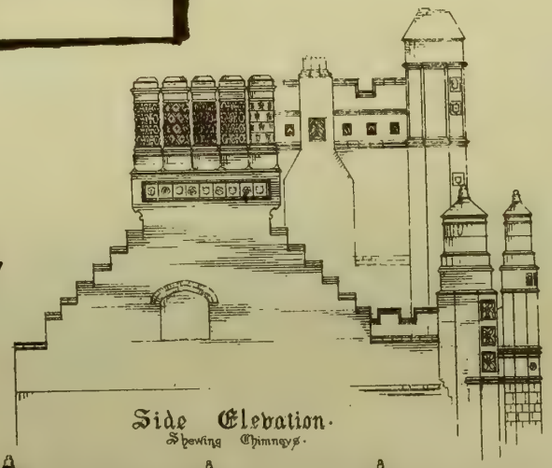
Jamb
B.

C.

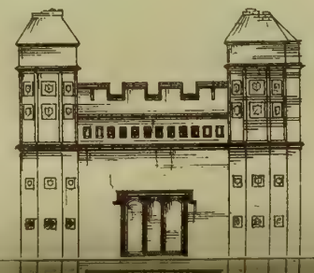


Detail of molding
at F





Side Elevation.
Shewing Chimneys.



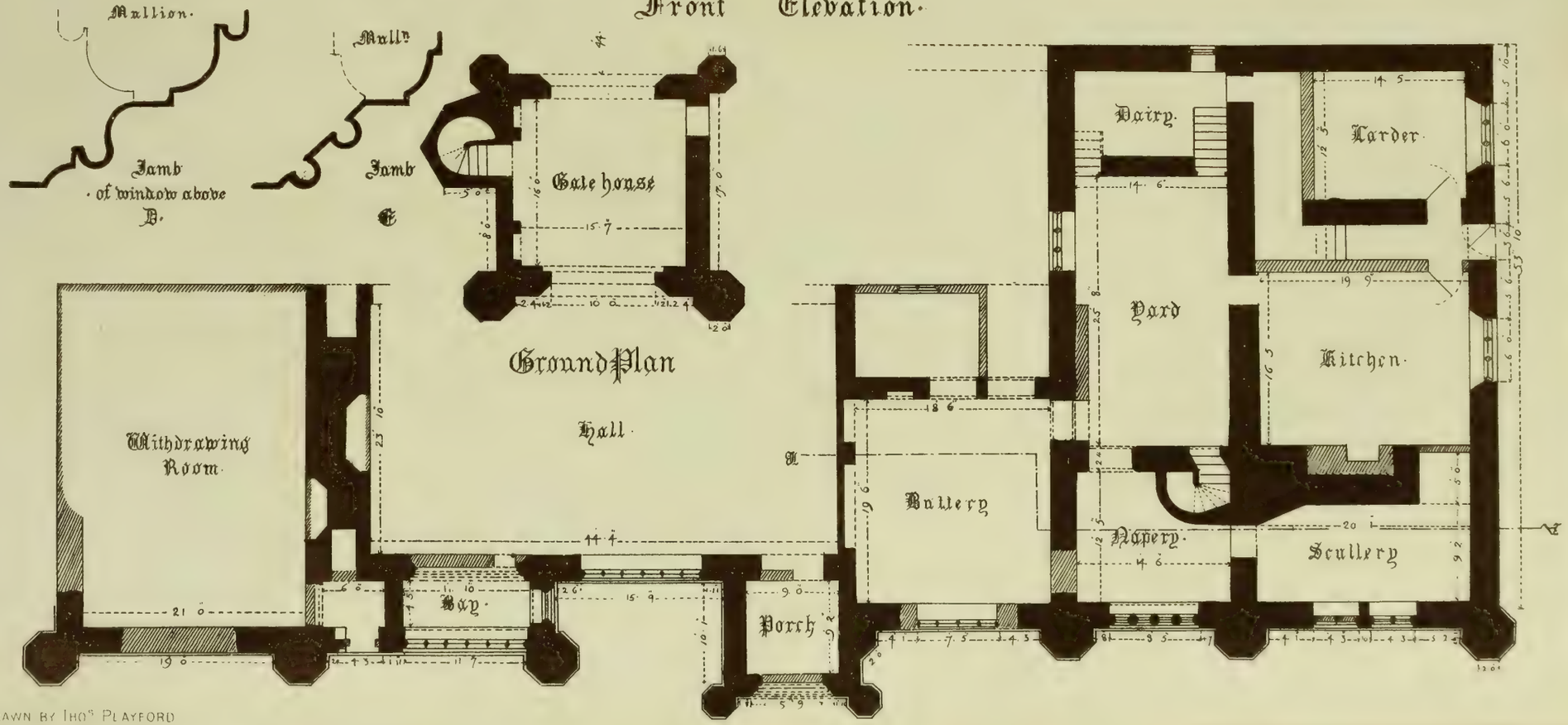


Panels.
Scale 2 feet to 1 Inch.



A B C C D E

Front Elevation.



Drawn by Thos Playford

Wolterton Manor House. East Barsham. Norfolk.

J Akerman Photo lith London





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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1818.
FRIDAY, NOVEMBER 8, 1889.

BUILDING CRAFTSMEN AND THEIR WORK.

AMONGST the inevitable results of international exhibitions of skilled labour such as that which closed on Wednesday in the French capital is the comparison which it invites between the productive skill and workmanship of the countries represented. Before the Great Exhibition of 1851 it was the wont of British manufacturers and art workmen to assume a high rank among the nations; but the result of the great World's Fair was to prove that, in many points, we were inferior in certain qualities of manufacture and skill. In matters of taste or art we were far behind. The English workman has made rapid strides since both in workmanship and design, and in many points or criteria he holds his own against the foreign workman. To be just to him, however, it is necessary to point out in what directions the French artisan and foreigner generally have the advantage,—the points of weakness in English training and workmanship. These data, for comparison, have been afforded in the reports drawn up by Metropolitan workmen on the exhibits and results of the Paris Exhibition, of which we gave a *resumé* last week. For many good reasons, we do not think the native artisan the right person to judge of the qualities of work executed abroad—first, because he has natural and national prejudices to overcome; second, because his education and modes of working are very different; third, because a feeling of *esprit de corps* would restrain him from acknowledging a superiority on the part of the foreigner. The outsider or professional artist has no such scruples: his predilections and sympathies are wider. He has no trade secrets to preserve, but is rather inclined—by perhaps self-assertion—to point out errors, and to show how much "better these things are done abroad." We cannot help noticing how this manifestation of trade instinct makes itself felt in reading the descriptions of foreign work; while acknowledging the superiority of the technical education and design, there is evidently a desire to discover defects in the workmanship.

In the first place, a comparison between the building artificers of our country and the Continent is hardly possible. A difference as great as it well can be exists between the modes of living, thought, and feeling of the two countries. House-rent is cheaper than our own. The Paris artisan can live comfortably at a rent of £12 or £15 a year; the firing, charcoal being the fuel, is much cheaper; he obtains his meals at a café when out. Provisions are cheaper than they are here, and the workmen generally frugal and abstemious. Soup, meat, vegetables, and bread are partaken of at breakfast, which is at 11 o'clock, the cost being about 5d.; then, at 6 or 7, after work, they have their dinner, consisting of soup, fish, meat, vegetables, bread, cheese, and wine, the cost of which is about 1s. 3d. The French workman's home is different: it is often at the café, not from choice, but convenience. The children are sent out to nurse, as the wife goes out to work; he sleeps where he can, and does not consider it necessary to keep up a house like his English brother. Wages are paid fortnightly or every three weeks, and piecework is the general principle of payment, and is preferred by both employers and workmen. By this system the workman often earns more than by day work.

We draw attention now to two or three principles which underlie the difference between French and English workmanship. First, the workman abroad has State protection; the Municipal Council contributes towards the Labour Exchange; trade disputes are settled by a court of experts, the Prud'homme established by the State. The English craftsman has no such aid, but is obliged to have recourse to trade unions, or to the ordinary legal tribunals, which are costly and inefficient. Secondly, the education abroad is technical and complete; the schools have workshops attached, pupils are admitted at 13, and have the run of the school for three years, one of which is spent in the shops, including a smiths' shop, engineers' shop, electrical engineers' shop, carpenters' and wood-turners' shop. The whole course is free, and the cost is defrayed by the Municipal Council. The English workman has nothing of the kind provided, except the new technical schools, which are few comparatively and expensive. Thirdly, the Parisian artisan is free to select his kind of labour; he has a personal interest in his work, which is encouraged by the system of payments whereas in England the artificer is made a kind of tool in a vast organisation of labour, his work being divided into branches, and he is, therefore, set to do a portion of a fraction of a building which he perhaps never sees and has no interest in whatever. We have proof of these facts in the artisans' reports.

One of the things we hear is that work costs more in France than in England; the men work, we are told, in an "easy-going way." Then, the foreign working man is his own master in many things: he is not dictated to as to modes of work; he can leave his labour for refreshment when he has a mind to do so, the time so occupied not being deducted if it is not more than a quarter of an hour. The men in Paris are paid almost the same wages for half the work executed. Now, we must not conclude that because the artisan's work is easier, and he takes longer about it, that the cost is greater, except in a very mercenary sense. It is true that, owing to grinding more work out of the workman, he pays the contractor better; but does his labour pay so well in the result? We question whether it does. The unanimous opinion of all who have seen the work of boys in technical schools is that it is a credit to the nation. The whole question of work is resolved into one of *time*, and this is a vital element which the English master does not appear to have fully taken into his consideration. The contract system is in direct opposition; its principle is to get as much work done as possible in a little time, and this has been so ingrafted in the minds of our great producers and employers of labour, that other considerations are sacrificed. The principle with the foreign workman and his employer is to turn out a good job. Even in the school work, time on a job is not considered, so long as the pupil turns out his work creditably.

The important bearing of the question of time, or freedom of individual action on the work actually turned out, may be seen in comparing English with French joinery. Last week we described an internal door as made in France, which is different in several particulars from our own. The stiles and rails are of equal width, about 3in. wide; instead of the solid English lock rail, a narrow panel is introduced, and upon the upper 3in. rail of this is the lock. If any reader will take the trouble of drawing out a door to scale, he will find it not so bad as the English joiner would be inclined to think from prejudice and habit. In many respects it is a lighter door, the wide panels of the whole width of door can be left for decoration, the middle rail panel is pleasing if not quite as strong, for every solid lock rail has a double tenon and two mortises. We are so accustomed from habit and years of training to use muntins dividing the door into two panels, that any other form looks wrong; but, after all, if it is a matter of design [illegible] quality which the English artificer is not very strong upon. Our system of mouldings is unsatisfactory, but it is used to save time and labour. The machine-made moulding is quickly turned out and planted, but every architect and artistic joiner is aware of the beauty of the moulding worked out of the solid, as seen in Mediæval and 15th-century work in this country.

To "plough" or rebate the moulding for panels, and to groove the back of it to fit on the stiles and rails, is a laborious, but certainly more workmanlike, proceeding than to merely plant the moulding in. It takes more time, and thus, in the eyes of our builders who take contracts, is an objection. Other details, such as rebating the edges of a door to make it fit closer, tonguing the skirting to the floor, stair construction, the jointing of a segmental frame, indicate greater labour, not in every instance necessarily stronger, but displaying more art and skill. To turn to a more artistic trade, the carver in wood is more of a specialist abroad than he is here; a figure carver can obtain a high remuneration for his work by confining himself exclusively to it, and there is enough of one kind of carving to make it answer, whereas in London a carver turns his hand from figures to foliage. In the carving art we have only a few men who can compare favourably with the specialist in Paris, owing to there being so little carving done in London, and what there is of a very miscellaneous kind. We are now alluding to the ordinary class of carvers, not to our few well-known artists in wood. Again, the carvers abroad have exceptional advantages in the fine collections of the Louvre and Tuileries, the Musée de Cluny, and other museums. The work, too, is also done in a more leisurely way than our own—piecework is generally followed, which prevents the cramping influence inseparable from the day-work system, and for the simpler kinds of carving it pays the workman better. On the whole, the Parisian carver is in better circumstances, and his work more appreciated.

In the matter of design, it is fully acknowledged that the English workman is behind his *confrères* abroad. The influence of design on workmanship is to make the workman think before he applies his technical skill; but it is owing to the piecemeal way we carry out work, the putting him behind the contractor, in not recognising his talents, that we have lost our position as designers in the special trades. Till design again assumes its rightful function among our artificers over construction and technical skill, craftsmen must perforce occupy inferior positions in the production of architecture.

INSTITUTE OF PAINTERS IN OIL-COLOURS.

THE seventh exhibition of this popular gallery opens with a goodly number of pictures, all the more easy of inspection because the council have wisely avoided overcrowding of the walls. Landscape, coast, and river scenery is, as usual, very strong. For freshness and clearness Thos. C. S. Benham's "Breezy Weather" is not surpassed; nor can we bestow less praise on Val Davis's "Lifting of the Mists"—a feelingly-painted study of mist as it rises over the beds of rivers. Mr. Davis has thrown a spell of beauty over the scene; the handling is soft, and the grey tones natural. Two other subjects, "The Edge of the Marsh" (93) and "Waste Waters," show him to be a master of these ever-pleasing subjects. John R. Reid, whose canvases are always poetical and full of fresh seafaring life, and who loves

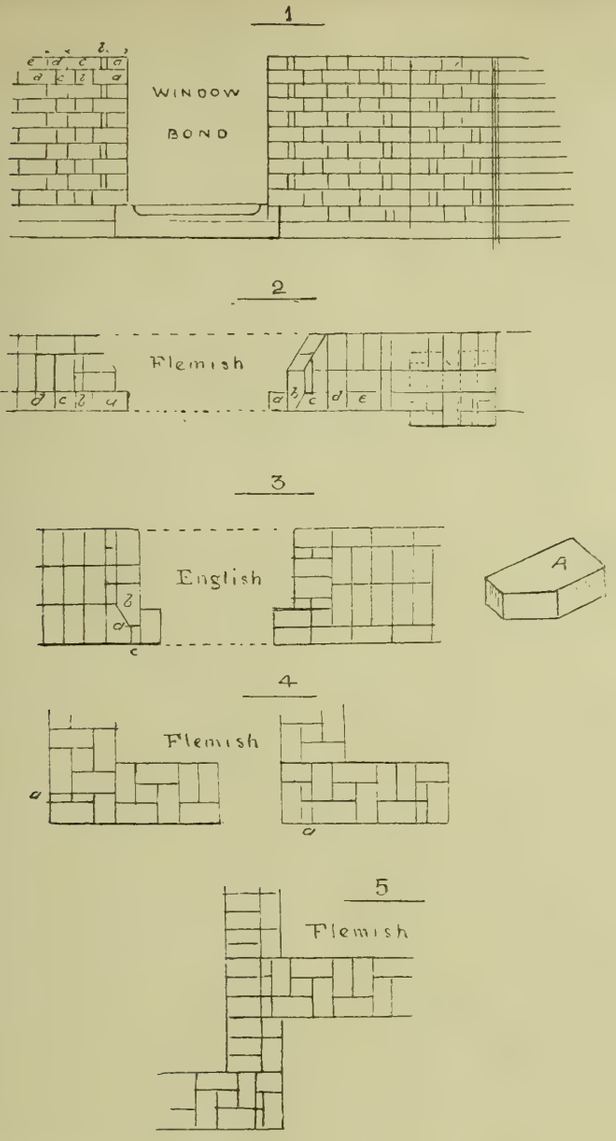
to take his themes from some quaint and busy Cornish fishing village, contributes two or three admirable pictures. "When the Flowing Tide Comes In" (8) represents one of those fishing villages—a veritable "haven under a hill," the colour strong, and the handling as dashing and spirited as ever. "The Gift of the Sea" (48) is another clever study of fisher folk and their spoils. Mr. Reid is a wonderful depicter of character, and this and another picture in the East Gallery are full of it; a few vigorous strokes and dashes and streaks of thick pigment daubed on sea and foreground being replete with suggestion and poetic meaning. "The Silent Close of Day" (10), by Moffat P. Lindner, a low tidal river; John White's "Hillside by the Sea" (13), "Rocks at Etretat," by W. W. May (52), "Rye," by Thos. Pyne (172), are each in their way worthy of the painters. Woodland forest and moor have here also their delineators. The vice-president, Frank Walton, is strongly represented in such pictures as "Self-Sown Firs" (16), the grand solid piece of hill painting "Leith Hill" in the Central Gallery (236), with its dark pines against a mass of delicate trees in the middle distance, rising above all being the outline of hills. The whole is soft and atmospheric. We can realise the descending slope and the wooded valley half-hidden by the foreground; the handling of ramified branches is dexterous. The "Home Meadows" is full also of sweet suggestiveness. We must pause before the thoroughly English and vigorously-painted landscapes of marsh and mountain by E. M. Wimperis. The bold sky and mountainous country in "Driving Home the Cattle" (43), "The Essex Common" (82), and the "Moorland Road" (425), with its gleam of sunlight and shadow over a broad expanse of undulating moor: the dark middle distance and atmosphere in the latter picture are equal to anything done by this painter in the *forte* he has made his own. Joseph Knight, in the same class of landscape, sends two or three characteristic pictures. "Late Autumn" (191), a ravine or hollow between hills clothed with pasture, with cattle grazing; the warm evening sun throwing its rays in gleams along the pass. The reflected light and shadows are painted with much fidelity. Perhaps the grass is less velvety, and the execution not quite so finished as we have seen in Mr. Knight's earlier work; but this work, and "Harlech Sands" in the East Gallery (453), a broad stretch of sand by the sea, are perfect transcripts of nature in her quieter moods. Joseph Farquharson (45) paints a charming snow-clad hillside with sheep wending their way down to the sheltered dale; the sunlight on the snow is cleverly and delicately handled. Good drawing and natural colour are shown in C. Burton Barber's pretty study, "Amateurs." Pleasant colour and feeling are evinced in Hugh Cameron's "The Laird o' Dumbiedykes Courtin' Jennie Deans" (20); the cottage interior and the young heroine of Scott's "Heart of Midlothian," with her suitor, are tenderly painted. "Among the Thistledown," by Frank W. W. Topham (27), is fresh in colour and dexterous in handling; Edgar Bundy's "Latest Lampoon" (22) is a pleasing reminiscence of Tudor or Stuart times—two old cronies reading a written satire. We have seen happier illustrations of courtship than the one John Scott gives us: "What's the Matter?" The young lady, seated on a drawing-room couch, looks very demure and prim, while her beau, in silk hose and embroidered coat, jauntily reclines by her side. The arrangement is painfully formal, though the picture tells its story. It is apparently the sequel of "The Welcome Arrival" (418), where the young gallant is entering the room with a handsome bouquet in his hand, the lady seated before her spinning-wheel; but the faces of the couple are cast too much in the same mould, and there is a weakness in the treatment and colour. Good colour and atmosphere are characteristic of Kenneth Mackenzie's "October" (49); near it is a portrait of "Miss Catherine Holt," by Percy Bigland.

T. B. Kennington's "Miss Marian Mackenzie" is a delicately-painted portrait of a fair young lady in white, whose rotund figure and low-bodiced dress are set off against a pale background with palms. Touching in its appeal to sympathy is H. R. Steer's group of early toilers in a murky London street at break of day; the salient figures in the foreground of a carpenter's young wife and child tenderly conceived and painted (95). "Heloise" is a well-drawn head. "Waiting for the Milkman," by C. E. Johnson, sunny and bright (104), Claude Hayes' mellow landscape (66), works by A. Chevalier Tayler (75), Miss Ethel Wright's decorative figure subject "Memory," H. Fantin-Latour's "Bouquet" (78), Miss Maude Goodman's "Family Legend" (69), Walter S. Stacey's "In Full Retreat" (131), and "Preparing to Attack" (148), clever and amusing incidents of cat and dog playfulness, are other works of merit. We must not forget John Fullylove's stately picture of the "Garden Front of Hampton Court Palace" (94), in which the horizontal lines of the palace terminate the vista of noble trees; the fountain, with its group of figures and water, add dignity and picturesqueness to the scene—the drawing is faultless. Cyrus Johnson's "King's College Chapel" is another of the few architectural subjects. Too garish and purple in its shadows and sea is Edmund G. Warren's "Harvesting near Swanage" (162), in other respects a delightful view of the bay.

Grey mist, groups of fisherwomen, and boats make up a pleasing picture by W. E. Morton, of Dieppe (173); near it, "Beaching, Hastings" (178), by Owen Dalziel, is also a nice study of grey, light and shadow. "The Mill Pool" (181), by Henry Chas. Fox, and a sunny and broadly-painted view of the river near Shoreham, "Ebb Tide," by A. Hartley, must be named, after which "Rook and Pigeon," by F. D. Millet, the American painter (184), arrests attention. Mr. Millet has happily arranged his figures of cavaliers seated at a table in an old inn parlour, playing cards. The fireplace, furniture, table, and straight-backed chairs are drawn with knowledge of the period (17th century); the execution is careful, and the facial expression of the gambler who is winning triumphant—one of the best pictures of its class on the walls. Passing Joseph Knight's "Late Autumn," already noticed, and a picture by G. G. Kilburne, "Good Entertainment for Man and Beast," badly drawn in the architecture of the porch—scarcely so good as former work; studies of tone and colour are seen in Miss Catherine Wood's "In Hues of Gold" (237), a pleasing picture of bronzes, sunflowers, and draperies; in Alex. Mann's "Fresh Pastures" (227); in Adam E. Proctor's "Upland Fold." F. C. Markham Skipworth's "On the Cliffs by Sea," is small, but delicately painted, with pretty sentiment in the figure of young lady seated on a ledge of rock, nibbling at a blade of grass which she holds, as she pensively looks at the sea. His studies of faces "Madge" (398) and "Florette" (406) are charming idealised portraits. A clever Bedouin head is sent by James Clark (246). W. L. Wyllie, A.R.A., paints "The Lull Before the Storm" (240), a scene of Thames craft, smoke, and reflection perfectly. A nice bit of colour is Oscar Wilson's figure-subject, "Venice" (241). Grouping and tone are well studied in W. Osborne's "Boat Builders." Pretty and natural is J. Clayton Adams's "Flowers of the Field" (252), and pleasing drawing and sentiment are seen in J. Haynes Williams's "The Proposal"—a young couple seated in a drawing-room, the gentleman with his elbow on his knee, modestly putting the question to the young lady, who looks somewhat undecided. One of the studies of fancy is C. Lawrence Burns's "Thistledown," children amidst tall grass. E. Blair Leighton's clever picture of "What Shall I Say?" a gallant at a garden gate, conversing with a young lady who is attired in evening dress, and evidently hesitating in her mind, displays careful execution and colour. "Shore Flowers" (302), by H. Arnold, in a light key of colour; the gleamy hillside of Charles Stuart (312), the clever technique and sunny light in Edward W. Waite's clever cornfield view (323); the pretty little sketch by Ernest E. Waterlow, "The Cliff Path" (330); Frank Dadds' cleverly finished picture of "The Scrap Book" (363); W. H. Pike's clever and animated studies of Venetian life, "Gambling for Polenta" (356) and "Curiosity" (574), crowded with figures and brilliant; "Jilted," by O. Harley (376); Thos. Collier's fresh-looking "Mill Stream and Lock" (403), and pure in colour, are among the noticeable works.

The East Gallery contains a few important pictures. A cleverly-composed nude figure subject, by Solomon J. Solomon, "The Evening Mist," represents a dreamy-eyed maiden, whose face and upper limbs are bathed in the roseate hues of the setting sun, her feet rising out of a thick mist. Yeend King's "Lengthening Shadows" is a figure subject; Alfred East's "Coming Night" is quite Turneresque in its handling (475), strong and effective. The warmth of colour and evening effect in T. Austen Brown's "Scanty Pasture" (486) (a large picture), forms a strong contrast to others on the wall; the composition is pleasing. Edward Hargitt has a fine landscape, "The Downs from Broadwater" (498), a pleasing work, the gleam of sunlight over the water and cattle excellent. River and coastscape is also represented by Alex Harrison in his "Evening," a study of water reflection between the darkened shadows of trees (458); Charles Wyllie's "Head of the Tide" (466); Smart Lloyd's "Evening on the Dart" (505); and by Edwin Hayes in his powerful sea view, "Penarth from Cardiff" (542), the shadow on sea and the sunlight effect at the entrance to harbour being well rendered. The battle incident by Robert Hellingford (543) is full of animation and movement, and depicts the capture by Prussian troops of Napoleon's carriage after Waterloo.

J. C. Dolman's picture, "Content" (549), is clever in the grouping, and the delicate drawing and colour of thistledown; so, too, we can admire Ernest Parton's sweet and mellow view on the margin of a river, seen through graceful branches of silver birch. "The Distant Shore" (553); Keeley Halswelle's "Summer Day," a sketch of flat pasture land by the river, such as we may see in Norfolk or Lincolnshire, is redolent, as usual, with freshness. John R. Reid's picture, "His Poll was Kind and Fair"—a Cornish village scene—is perhaps too forcible and sketchy to attract the gallery visitor, whatever its merits; but even this is outdone by T. Hope McLachlan's "October Storm"—a scene of wild devastation (567). A very washed-out looking effect is H. Fantin-Latour's "Songe" (512), hardly worthy of the artist's talent. Other pictures to note are by C. N. Kennedy (493), Julius Price (501), a nice study of weeds by W. D. Adams, a figure subject by T. B. Kennington (471), the rocky shore of "Iona" by Robert W. Allan, John White's rubicund faces, "Cherries," and Yeend King's "Orchard" (526). "My Lady's Garden," by Arthur Hacker, suffers by the vivid green, in spite of the good drawing of figure and fountain, and the subject is scarcely worthy of the size of the canvas; we have seen better work from Mr. Hacker.



ARCHITECTURAL BRICKWORK.—XXII.

WINDOW BOND.

CONTINUING our remarks on the execution of window bond in the reveals of windows and doorways, we intend to show the importance of arranging the widths of piers between openings by calculating the number of whole and half bricks, instead of leaving the matter to the bricklayer to be worked out as he pleases. It is necessary to remark that as Flemish bond is generally used for appearance sake, very few widths will give the regular bond in every course. Thus, two-and-a-half bricks, four-bricks, five-and-a-half bricks, and the seven-brick piers give the desired regularity. In Fig. 1 we give an example of a window-aperture in a wall of two bricks thick executed in Flemish bond. The pilaster is a projection of 2½ bricks wide, the bond being laid with closers in every other course. If the pilaster had been of 2¾ bricks in width, a very irregular bond would result. In every course there would be a closer or quarter-brick, but at alternate ends, and two headers would come together in one course and two stretchers in the next, the order being in one course: header, closer, two headers, stretcher; in the next, two stretchers, closer, and header. Now, such irregularity is more noticeable in a narrow pier between windows and in pilasters than it would be in a wide expanse of brickwork, and therefore the architect should seek to adopt dimensions which afford the necessary regularity of bond. By referring to our plan, it will be noticed there is a pier between the pilaster and the opening of 3½ bricks. If the reader will refer to the letters in plan and elevation, he will see how the bond is worked. In the top course shown in elevation there is a header next reveal (*a* in plan), next a quarter-brick (a king-closer on plan *b*), then a three-quarter brick bevelled, as shown on plan *c*, next a header *e*, &c. In the next course, below the first brick forming the reveal, is a stretcher, next come two headers, *b c* in plan (left-hand side), and then another stretcher, by which it will be seen how the bond is not perfect.

REGULAR FLEMISH BOND.

A more regular Flemish bond is secured by a pier of four bricks wide, where in one course there would be header, closer, stretcher; header, stretcher, closer, header; and in the next, stretcher, header, stretcher, header, stretcher. Thus it is observed one course would finish with headers next reveals, and the successive course with stretchers; but the bond would be regular, and the closers inserted every other course at each end. We advise the student to draw a few examples of brick piers in this manner, and of different widths, with plans of successive courses, properly breaking joint. By looking at both sides of plan, it will be seen how the bricks are arranged to obtain good lap; a stretcher, for instance, on left-hand side (*a*) would cover the joints between *a*, *b*, *c* (right side of plan); then the next brick a header should cover joint between *c* and *d* same side, or, if necessary, a closer should be put in to make it do so, though this would depend on the length of brick *c* after it was bevelled or cut to the splay. A proper lap should be 2¼in. In plan 3 we show a brick reveal in a wall of three bricks thick executed in English bond. Two king closers *a* and *b* are introduced to form the reveal, and a closer *c* is inserted next the reveal brick. In the next course these joints between bricks *a*, *b*, and *c* are covered by two stretchers forming a 9in. or one brick reveal; the other bricks forming the rebate for frame is composed of headers and closers, which will be found to overlap the joints shown on the left-hand side of plan. Fig. A shows a king-closer; the bevelled end shows half the width of brick, or 2¼in., the other end being the full width. In reveals to windows, as we have seen, it is commonly introduced to save the use of closers and half-bricks.

QUOINS.

In Plan 4 we show two successive courses of a Flemish wall of one-and-a-half brick in thickness. Here, it will be noticed, the closer is introduced in the alternate faces of the quoin, *a*, and the through joints alternate in the two courses similarly. The object should be to prevent the inner face line of wall being carried through in every successive course. Plan 5 represents the mode of forming a projecting wing, or the external re-entering angles of buildings in Flemish bond, the projection being three bricks. Here we shall find the same rule observed in making every other course overlap the through joints; thus the cross wall forming inner angle shows the joint 2¼in. from face of projecting wall, the next course would show the joint carried through in line with the outside face of projection. Of course every bricklayer adopts his own plan of forming the quoins or outer angles. The plan we give in Fig. 5 represents front wall of double Flemish bond, showing on both faces. In good work the closers should be checkered—that is, be arranged so as to cross one another in the two successive courses.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE opening meeting of the session of the Institute was held on Monday evening, the President, Mr. Alfred Waterhouse, R.A., in the chair. The deaths were announced of Samuel Musgrave, of Hull, Fellow; Gerard Ford, of London and Brighton, Hon. Associate; and Firmin Epellet, of Arras, Pas de Calais, Hon. Corr. Member. Mr. Macvicar Anderson stated that the restoration of St. Mary le Strand was now complete; the church had left the speaker's hands in a sounder state than that in which it left the hands of the original architect. Mr. Ewan Christian remarked that before the restoration was commenced he assured the parishioners that structurally the church was a sound and substantial building. Mr. Ralph Neville asked if an opportunity would be given to architects to see the church, which was always closed except on Sundays. Mr. Anderson remarked that the beadle lived close by. Mr. James Brooks said what was wanted was that architects should be able to see the church, say for a week after the reopening, without hunting, with a silver key, in courts for an official.

THE INAUGURAL ADDRESS

was then delivered by the President. He congratulated the members upon the fact that during the past year the new by-laws had been approved, and had come into force. Under one of those by-laws nine non-metropolitan architectural societies had entered into alliance with the Institute, and all those societies were now assisting in the conduct of local examinations. The members of the present council were the first elected by voting papers sent and returned by post; but, notwithstanding the facilities thus offered, only about 500 members voted out of 1,200 who had the power to vote. During the

session 112 gentlemen were admitted to the examination in architecture. Of these 82 passed, and 81 Associates were elected during the session. Instead, therefore, of the obligatory examination being a deterrent, it seemed to be a positive attraction to the young architect, and no sign could possibly, the President thought, be healthier, no evidence more encouraging, to those who had the practical examination system at heart. Besides these, 62 Fellows were elected, of whom 26 had been Associates, so that the number of subscribing members reached a net total last September of 1,350, as against 1,200 in 1887, and 1,190 in 1885, at the same period of the year. With such additions to the classes of Fellows and Associates, with the certain prospect of still further additions, and with a council increased from 21 to 34 members, came the pressing consideration of how could be gained the needed expansion of their premises, and on this the council might shortly be expected to submit an important proposal. Greater space was needed for the always increasing library, and better and more private accommodation for the conduct of business. The library now consisted of upwards of 8,000 volumes, and was, he believed, the only special architectural library in the United Kingdom. In referring to the presentation of the Royal Gold Medal to Sir Charles T. Newton, the President remarked that, with the conspicuous exception of that medal, British architects had been content to do their work without much intervention, or even recognition, from the State. If their creations were noticed in either House of Parliament it was generally with very equivocal praise, if not with open abuse, though that need not very much disturb them. Our legislators had little leisure for the contemplation of the beautiful in art, and seldom roused themselves to any studious appreciation of architecture, except to such adverse criticism as politicians in opposition found convenient for the harrying of a First Commissioner of Works. An eminent German, a member of the German Parliament, Dr. Reichensperger, had explained the attitude of the State towards the British architect in interesting terms. He had said: "The well-known aversion of the English to bureaucratic over-governmentation exhibits itself even in the domain of art, especially in that of architecture. There is on the other side of the Channel no hierarchically classified and betitled band of architectural officials; neither do we meet in England with establishments founded and supported by the State for the education of architectural students, nor with governmental examinations, nor with official diplomas thereupon granted. Nevertheless, the English continue to execute architectural works of all kinds, not only in no respect inferior to our own, but, in my estimation, actually superior from an æsthetic point of view." This praise from a well-known German ought to be some consolation to English architects, if we were tempted to think that from authorities at home abuse came more naturally to us than honours. There had, however, been a gratifying instance to the contrary during the past year in the knighthood conferred on their former Vice-President, Sir Arthur Blomfield. Among the subjects which engaged attention during the past session was that of an amended form for architectural pupilage. The proposed form was rejected at a general meeting of the Institute in consequence of the omission of the words "and surveyor" from the title of the third party to the contract—viz., the architect. He would propose, as a compromise in the form to be issued, to omit all definition, and to leave a blank, which could be filled in with "architect," or "architect and surveyor," as might be deemed fit. The new form, the substance of which was approved, made provision for such absence from the office as might, in the opinion of the principal, be reasonably allowed to the pupil for qualifying himself by attendances at lectures and classes for the Institute examinations, and contained a clause arranging for the refunding, before a given date, of a portion of the premium in case of the inability of the principal to perform his side of the engagement. Mr. Waterhouse next dealt with the scope of the Institute examinations, with special reference to remarks made by the Professor of Architecture at the Royal Academy. Mr. Aitchison would make no inquiries in these examinations as to the historical or archæological knowledge of the student under examination, but simply test his fitness as a building constructor, entirely irrespective of archæological peculiarities—*i.e.*, styles of architecture. Though he disagreed with the Professor to this extent, that he thought it would be most desirable for every architect to know a little about the styles which have brought architecture to its present position, it was most important that the examinations should never have anything about them likely to fetter the student in any way; and he thought that, under the present system, the utmost freedom was allowed their students in all that concerned the inventive side of their art. It was better to encourage independent judgment and invention in devising means to a prescribed end than any slavish conformity to ancient precedents. But they would be very unwise to refuse to take advantage of the accumulated experiences of the past, or to completely sever that tie of tradition which made the acquisition of architectural knowledge partly a study of history, and connected from age to age with the life of a nation. Again, a proposal was made on the award of the Soane Medallion and other prizes, that they might premiate a design, which did not fulfil the prescribed conditions, and was avowedly unfit to be applied to the purpose for which it was intended, if only it displayed some excellence of design, or, rather, some originality in external appearance, obtained, perhaps, at a sacrifice of internal convenience. This he regarded as a very mischievous doctrine. If their structures were not fit for thetr purpose, architects could not hope for much public appreciation, however striking the appearance may be. Buildings without a purpose, or unfit for that purpose, might, from their artistic qualities, arouse their enthusiasm as antiquaries or archæologists; but they would look upon them with other feelings if they had had to pay for them themselves, or if they were to try to use them. Architecture implied art under certain well-defined conditions, and if unrestrained it became mere constructive stage scenery. The more closely students, and, in fact, all of them, stuck to the conditions of the problem they had to solve, while striving at the same time to give their work the highest artistic expression of which they were capable, the sooner would modern architecture secure public appreciation. Mr. Waterhouse spoke in eulogistic terms of the Paris Exhibition, which he deemed to be the most noteworthy event of the current year, and referred with approval to the decoration of the Palaces of the Fine and Liberal Arts, designed by M. Formigé. While the Eiffel Tower was an agreeable disappointment, he deprecated the erection of a sister colossus in London. In the matter of tree-transplanting, the Parisians had much to tell Londoners. It was devoutly to be hoped that the County Council, when they had time to consider the beauty of London, would ordain that the wider thoroughfares of the Metropolis should be graced with a mode of decoration at once the least expensive and the most effective that could be used for the adornment of a great city. Why should not London be known as the city of plane trees? It was a great mistake to suppose that trees in most cases hid a building to its detriment. By their contrasting forms they heightened its effect, and this not only in summer, but in winter also, when the curves of branch and twig formed an admirable foil to the rigid stability of the architecture seen through and above them. He would strongly recommend the English student to avail himself of any opportunities in the galleries of Comparative Sculpture (casts) recently opened in the western wing of the Trocadéro at Paris. Mr. Leonard Stokes, in his recent excellent address as President for that session of the Architectural Association, treated very fully the subject, annually becoming more urgent and irrepressible, of professional education. He maintained that the time had now come when the Institute and the body he represented should work together more than they have yet done, to effect this their common object—to prepare for examinations as well as hold them. He would commend Mr. Stokes's utterances on this point to the attention of every member of the Institute and the Association, believing as he did that the senior and representative body of the architectural profession would do wisely, if the way could be made clear, to give substantial help to those who, during a long and prosperous period, had shown an earnest determination to help themselves. There had also been a proposal, to which Mr. Stokes alluded, that an appeal be made to the public for a large sum to establish and endow a college for the systematic study of architecture. Those in favour of the proposal seemed to think that not enough was done for the student, and that he was left too much to his own devices. In this country there was no single or complete and unalterable course of architectural education apart from the practical knowledge the student might acquire in the office of his master. He did not think this was to be regretted. It was better not to be all cast in the same mould—in fact, as artists, it was most important that they should not be so. There were certain matters, however, that all architects must be versed in if they were to do their work with ease to themselves and advantage to their employers. The Institute was not, however, and was never intended to be, a teaching body. At the same time it did further the systematic education of the young architect (1) by its system of examinations, (2) by its annual prizes and awards, and (3) by its library. Moreover, the Council of the Institute had now put in force a scheme for three progressive examinations following each other at intervals of not less than two years—a preliminary, an intermediate, and an advanced examination. For the preliminary examinations to be held this month in London and various parts of the United Kingdom, 107 candidates had been admitted; and of these, 41, having been declared exempt, were already registered as probationers of the Royal Institute. Secondly, the student was incited to effort by prizes offered for the design and construction of buildings or parts of buildings in some prescribed style, or for some special purpose, and for the best essays on given subjects, and also by travelling studentships, the winners of which had, according to the nature of the respective studentships, to submit illustrated memoirs on modern architecture abroad and modern practical subjects generally. Thirdly, the library was open not only to the members of the Institute and the Association, but to all *bonâ fide* students of architecture. Having referred to outside means of education, Mr. Waterhouse added: It will be seen that the student of architecture need not now, therefore, be under any difficulty in ascertaining what is the least he ought to know, or how he can, with diligence, acquire the requisite knowledge. Familiarity with the practical work of carrying out a building will be obtained in the office of the master whose pupil he is, and original design can be practised at home, in the schools of the Royal Academy, in the classes of the Architectural Association, or elsewhere. What seems to be wanted now, more than anything else, is the self-denial and enthusiasm necessary on the part of the pupil to fully avail himself of the advantages and privileges at his disposal. He had said little yet about the methods of teaching adopted by the Architectural Association, which had had remarkable results—results which, like many other great things done in this country, had been due principally to voluntary effort. The Architectural Association had been a great success, and it was still so much a success that he hoped every one of the non-Metropolitan societies allied to the Institute would soon have connected with it an association of juniors, similarly constituted, and doing equally beneficial work. Without such teaching bodies to feed a professional society, not only education languishes, but the society itself might die of inanition. In urging upon the allied societies the desirability of organising, or perhaps in one or two cases of developing, classes of instruction for their juniors, he could not do better than offer them as a model the methods of mutual instruction so long successfully practised by the Architectural Association of London. At the same time he understood the difficulties under which the Association laboured, aggravated as they were by the increased obligations entailed upon its committees and officers from the development of examinations. The chief cause of complaint was that the many classes held by the Association were not so well attended as they ought to be; and after reading the last Report of the Association he was induced to think that too much was attempted, considering the comparatively limited time which could be given to each subject by students occupied most of the day in their masters' offices, and by members of committees and visitors, who had their own business to attend to. If a college of architecture heavily endowed were to descend upon them from the skies, he was not certain that it would be an unmixed blessing. Thoughtful critics among their Continental brethren appeared to agree that there was something in the freedom of English study and practice which was at the bottom of the good

results they had been willing to signalise. Let them not, therefore, hastily throw away their birthright. Let them examine the student to ascertain whether he possessed at least a minimum of technical education—that he was able to make a respectable drawing, and to design a fit and convenient building. When that had been ascertained, the sooner the student was left to his own devices the sooner he would develop his inventive faculty and his artistic judgment. At present, in England, the students came under different influences, and were early thrown to a certain extent on their own resources. They did not all drink at one fountain, as would be the case if they had a Heaven-descended college; and, in consequence, there was more individuality about English work than could be found generally in the modern architecture of France and other Continental countries long in possession of that home of architectural learning for which some of them sighed. But he was far from thinking that everything connected with their profession and professional education in this country was perfect. Ours was the only great country in Europe which did not utilise its national buildings and monuments for educational purposes. Her Majesty's Office of Works and Public Buildings appeared to be the only department of the kind, among the great nations of Europe, that had no educational aim or influence. Ours, too, was the only great country in Europe that settled the artistic character of its national buildings at the fag-end of a Parliamentary session, by a party vote, in Committee of Supply, often after a public discussion, in the columns of a morning paper, by persons perhaps the least competent to understand the subject. In this country there existed no Board analogous to the French "Council-General for Civil Buildings," the members of which still met twice a week in Paris, and had done so ever since the foundation of the Council by the Minister Colbert, some 225 years ago. A similar Building Council, appointed by the Government, and partly composed of professional architects, was wanted in London. To serve thereon would, as in France, be considered the highest distinction, for obviously the honour would be only offered to those whose technical training, artistic judgment, and tried impartiality were beyond question. More was wanted than an architectural Council for National Buildings. A special tribunal for the consideration and settlement of building cases was also required. We were daily threatened with structures of abnormal height. Did it not behove us to consider the propriety of such structures, not from an artistic point of view alone, but also from one of health? Were we prepared to see London, by the introduction of these buildings on stilts, lose all sense of harmony and proportion? This question and that of rights of light and air were doubtless difficult to deal with; but they would have to be considered, probably, when a vast amount of mischief had been done, and could not be undone; and the sooner some constituted authority took them in hand the better. Why should not they give people who have already done so much to beautify our cities some protection—some assurance of immunity? They were all proud of the freedom claimed by the free-born Briton to do what he would with his own, and were jealous lest their liberty of action should be interfered with; but, nevertheless, the law in some cases stepped in to prevent individual action when it affected the senses of the public prejudicially. Yet there was nothing at present to prohibit the owner or occupier of any house erecting, with his landlord's consent, any sort of vulgar advertisement on his property. The sense of propriety and refinement possessed by a portion of the public was powerless to restrain such vulgar exhibitions; and, for the sake of the architectural effect of our cities, they should be no longer apathetic. Were advertisements taxed in some ratio to their obtrusiveness, much good would no doubt be effected; but, beyond this, it appeared that they wanted some constituted authority to which individuals feeling themselves aggrieved might refer any act of vandalism, any offence against artistic propriety or educated public taste. The great measure of Local Government passed by the Legislature during the Parliamentary Session of 1887-88 would have increased the boon it had conferred on the nation had it included provisions for testing the qualifications of architectural, engineering, and building officers appointed under the new Act. An excellent provision, found only in the Metropolitan Building Act and a few local Acts of Parliament, should, he maintained, be applied generally throughout the country, in order to insure the efficiency of all technical officers employed by the Urban and Rural Sanitary Authorities, for it was under the control of those officers that the vast majority of dwelling-houses throughout the United Kingdom were erected, and mostly by speculators, who, though they might employ an architect to make the designs or sketches for such buildings, did not allow him to superintend their erection. Having referred in appreciative terms to the use of terra-cotta in the new Birmingham Assize Courts, the work of Messrs. Ingress Bell and Aston Webb, the President remarked, in conclusion: As a profession we are surely advancing. The education of our students is now based on something of a system, and we see among the productions of some amongst us a true artistic sense of the beautiful overlaying a desire for the fitness of their work as means to a useful end. There never was a time when there was a higher tone in the profession, when the necessity for clean-handedness was more generally understood. The regret everywhere felt among us if a member of our body forgets or disregards his obligations in this respect is to me a proof of the rarity of the occurrence. I think, therefore, we may take a hopeful view of the future of the profession. Its progress under its altered circumstances during the next few years will be watched by many of us with interest, and by a few perhaps with some anxiety also, lest any part of the new machinery should fail to work quite smoothly. Should that be the case, we have happily those who devised it at hand to set it right. A natural fear may linger lest the inventive artistic faculties which every architect must possess in some degree should not have free play in the course of our examinations; but as this is guarded against by the present system, I see nothing to prevent our noble profession achieving in the near future great results.

A vote of thanks, moved and seconded by Sir Arthur Blomfield and Mr. R. W. Edis, was heartily accorded to the President for his address.

ARCHITECTURAL ASSOCIATION.

THE second ordinary meeting for the present session was held on Friday evening, the president, Mr. Leonard Stokes, in the chair. The following 64 gentlemen were elected as members:—W. P. Corby, H. Tinker, T. G. Charlton, J. W. Acock, A. B. Thomas, C. E. Salmon, R. H. Davies, A. G. Wright, W. C. Waymouth, W. Kerr, C. W. Dawson, W. Wier, F. P. Theobalds, A. Easton, F. E. Halford, H. B. Tabberer, B.A., C. C. Dornbusch, P. G. Newell, D. Dinwiddy, L. S. Rogers, J. Mew, K. Sakwrai, B. W. Austin, A. R. Read, L. E. G. Collins, A. J. Meacher, G. R. Morriss, W. G. Perkins, A. E. Pett, W. E. Pitt, W. E. Davis, H. J. Cox, F. H. Price, E. F. Selby, J. W. Paul, J. A. Page, C. R. R. Clark, V. H. King, G. P. Allen, F. K. Kendall, A. S. King, B. D. Cancellor, C. J. J. McCormick, F. A. C. Smith, J. A. Cooke, E. H. Ward, J. P. Clark, G. B. Lee, G. H. M. Trew, A. N. Wilson, A. E. Gamble, C. H. Aveline, A. E. House, E. J. Kerr, T. J. Mackness, H. D. Austin, W. C. Hulbert, A. E. White, W. B. Hopkins, H. W. Johnson, C. B. Howell, G. M. Nicholson, H. C. Lander, and J. Souter.

THE TREATMENT OF ANGLES AND INCLOSING LINES.

MR. FRANK T. BAGGALLAY read a paper on this subject, illustrated by a very large collection of mounted photographs of European public buildings. The author pointed out that when the design for a building ceases to depend for its effect solely upon the grouping of the parts and features, or upon their proportions; when, in fact, it becomes a question of adding something in the way of ornament, or of modifying form to produce an ornamental effect, certain parts of the building immediately offer themselves for treatment. Of these parts the angles are sure to be among the most prominent. They are the terminations of the several faces, and two of them must, in every view, form the terminating features of the whole composition; they are, too, the points at which, if a change of architectural treatment is required, that change must be made. An angle is generally more important than the middle of any front, for while the latter is important to one face of the building only, the treatment of the angles affects the whole. It is customary to say that the angle of a building requires strengthening—apparent strengthening, that is. This want is greater if the walls are much cut into by large windows that appear to destroy the horizontal tie, and again greater if the walls are practically reduced to a series of piers, and it becomes a practical necessity if the walls are cut into by arches having an outward thrust. But in the simplest case of a building with plain walls, broken only by ordinary windows, there is an immense æsthetic advantage in any arrangement which seems to give to its angles a stability sufficient to hold up the mass between them. Another common saying is that the angles of a building require to be emphasised. Whether or no this dogma is to be accepted depends very much upon how it is interpreted. On the one hand there are old buildings and some few drawings of modern ones in which the actual angles—the arrises dividing two main faces of the building—have been deliberately rounded off, and the effect was not only inoffensive but decidedly good. Again, in using such features as pilasters and buttresses at angles, it is more effective to plant them a short distance within the faces, and leave the actual angle alone, rather than to put them absolutely on the angle. But if we understand that it is a point in the design rather than the particular line which is to be emphasised, then no maxim of design is worthy of greater respect. There is no sort of design more poverty-stricken and contemptible than that which seems to come to no definite conclusion, and to have no bounds which it might not overstep. We are all familiar with this kind of design in street fronts in which the windows, piers, columns, pilasters, and other features are all set out at equal distances, all the same width and similar in design; fronts which look as if they were slices cut from a huge bar or sheet, and sold by the lineal yard, like calico or wall-papers. The effect is not quite so noticeable in detached buildings, but even in them it is sufficiently disagreeable. An angle, therefore, demands especial treatment, and is the architect's opportunity. But it is also prolific of difficulties and dangers, and the success or the reverse with which a designer seizes the opportunities, overcomes the difficulties, and escapes the pitfalls, is no mean test of his skill. Some of the difficulties that occur at angles are familiar to every student. There is the Greek Ionic capital, the volutes of which have to be so awkwardly bent out. There is the difficulty in spacing triglyphs and modillions at angles, to say nothing of the corner dentil; and there is the enormous projection of every cornice when seen across the corner, made so much worse when there is a corner column beneath it. A good safe rule is that columns at corners should be avoided if possible. The Greeks, it is true, used them in their large peripteral temples; but for one thing the Greek columns had such an excess of strength that any little comparative weakness of appearance, due to position, was of small importance; and, secondly, the introduction of a fresh feature at the angle would have been fatal to the simplicity at which they especially aimed. But they showed their appreciation of the fact that angle columns do naturally look weak by giving them an inclination inwards, and by making the intercolumniations at the corners comparatively small. Another illustration of a difficulty in dealing with an angle from Classic and Renaissance architecture occurs in the internal angles of buildings, the interiors of which are decorated with pilasters. When pilasters meet in the corner, one is apt to get an ugly little slip or corner of one of them; or else a pilaster with a bend up the middle of it, which is not much better. These are some of the difficulties. The chief source of danger is the habit of drawing things in elevation only, forgetting to think how they will look in perspective, or from other points of view. Beginners sometimes go so far as to draw two elevations of a building with so little reference to one another that, when they come to be put together, they will not fit; the cornices and strings are at different levels, or some of those on one face come to a sudden stop at the corner and disappear on the other side. If strings, or cornices, or other features are wanted on the main front of a building, and not upon an adjacent side, the manner of stopping them requires careful consideration. If all the similar features can be confined to one front, it is simple enough; you return them all upon themselves before they reach the angle at all, as is so often done in modern street fronts, the angle being

left bare. There is one thing that must not be done: they must not be cut off square and left. The best thing, if it can be managed, is to have some special angle feature, such as a pier, against which the horizontal features can be stopped, or round which they can be carried. If this is not possible, then it is best to return them, for a short distance at least, round the corner, and, if there is no feature or excuse to stop them, one had better be improvised. Most people fall back on a bit of carving, which at least brings them to an honourable end. The various ways in which the external solid angles of buildings may be treated fall naturally under three heads. Under the first is a single, simple, but exceedingly effective treatment. It consists merely of leaving the angle alone—that is, of leaving a breadth of plain, unbroken wall on each side of the arris, of greater or less width according to circumstances, allowing, probably, the main cornice and plinth, and perhaps some other important horizontal features, to run round, but stopping the rest of the breaks some distance from the angle. This splendidly simple treatment is especially effective if the other parts of the walls are much broken up, and if the breaks consist of a long range of regular features such as an arcade, colonnade, or series of large openings. But in the plainest and simplest buildings the amount of effect one may get by merely crowding up the openings a little towards the middle of each front, so as to leave a good width of plain wall surface at the ends, is hardly to be exceeded by that which may be obtained by the most elaborate means. In the second group may be put all such treatments of angles as arise from the use of such simple features as quoins, piers, pilasters, columns, buttresses, and so on, either singly or in groups. And in the third come the more important angle features. I have been rather surprised to find how seldom ordinary quoins have been used in important buildings, or by the best architects of Renaissance and modern times. The most prominent examples in well-known buildings are those of a few of the Florentine palaces and some of the London clubs, notably the Travellers' and the Reform. But in his later works, even Sir C. Barry abandoned their use. Although quoins do emphasise and strengthen an angle in a simple and logical way, they have a tendency to dwarf a building by destroying its scale. The simplest way to counteract this tendency is, evidently, not to make the contrast between the quoins and the general wall surface too marked; in using stone quoins with brickwork, not to project them beyond the general wall-face, nor to make them very large; in using rusticated quoins with plain stonework, not to make the rustications too heavy, and only to resort to rock-facing when the rest of the wall is rusticated. In all times and countries the feature most commonly used for the purpose of marking the angles has been the obvious one of a strong pier, marked off by its projection beyond the general wall surface, or by its special treatment. Of the Greek and Roman periods, the little temples, "in antis," may be quoted; even in the peristylar temples, the angles of the wall behind the peristyle were generally marked by antæ, and in the Roman basilicas and tombs the external arcades and ranges of columns or pilasters were stopped at the angles by piers. In Byzantine architecture the exterior of the buildings received so little consideration that it is not surprising to find no particular attention given to the angles. But in the Romanesque, which appeared after the period of barbarism, they are again marked by piers or, as Sir G. Scott called them, "pilaster-strips," which were always wider, and usually a great deal wider, than the strips by which the rest of the walls were divided up. The pilaster-strips became in time the shallow buttresses of the later Romanesque and Norman styles, and through them the ancestors of all the subsequent developments of buttresses. But quoins also seem to be descended from them, and in this way: all the pilaster-strips were generally—at any rate, generally in the commoner class of work—built up of alternate flat stones on end, which had little or no hold on the walls, and long stones laid flat and tailed well into the walls. One may see it is so by examining almost any bit of Saxon architecture. But this method, when it came to be used at the angle, seems to have puzzled the simple builders of the period to some extent. They seem to have come to the conclusion that the best solution was to make the bonding stone tail into both walls; and thus they arrived at the peculiar, primitive form of quoins we call long and short work. Whether this form was the parent of modern quoins, or whether, as is more probable, other workmen in other places met the same difficulty by tailing every stone into the walls, first one on one side and then one on the other, I cannot say; but in either case, quoins would be the lineal descendants of the pilaster-strips. The angle strips, if they were not merely the last of a series of narrower strips forming the piers of a shallow arcade, as in the lower stages of the cathedrals at Pisa and Lucca, were connected at the top, and generally at several other points, by corbel-tables which brought the wall out flush with them, and served excellently well to tie them into the general mass. The style was spread over nearly the whole of Western Europe, and developed in different directions in different parts. But even when the styles had wandered so far apart that their common origin is unrecognisable, as in the towers of Durham Cathedral on the one hand, and the west front of Piacenza Cathedral on the other, we still find the angle piers marked and prominent. In the northern example, however, they seem already to foreshadow turrets, while in the other they have nearly developed into the broad pilaster form, which they have already still more nearly approached in the cathedral of Genoa. Angle piers continued to be used throughout the Middle Ages. Even after buttresses had been developed from them we find them persisting also in their original form; still, as a rule, stopped by a corbel-table or cornice at the top, and generally with a buttress planted against each of their faces. Later on they projected further and stopped the cornices; themselves running up into pinnacles at the top. They and the buttresses planted against them gradually became more and more elaborate, and their grouping more and more complicated, until they developed into the graceful groups that mark the angles of the great church towers of the Late Gothic period. To analyse these groups would be an impossible task. All have a central pier, the pinnacle of which overtops the rest and dominates the composition, and against the two faces of it are planted buttresses. But how those buttresses are treated is a matter of taste. Except as regards the dominating pinnacle, the buttresses have become the chief thing in the group, and, as a matter of fact, the pier frequently exists only in imagination or for part of the height. Its pinnacle is left, and the buttresses are placed, not at the angle of the wall, but at what would be the middle of the face of the pier; but the pier has no projection, and is not to be distinguished from the wall face. One sometimes sees groups of angle buttresses and pinnacles without the central pinnacle; but I do not remember any such groups which appeared to be quite a success; the effect, too, is usually made worse in such cases by the buttresses being placed close up to the angle. There is an early development of the angle pier that is exceedingly effective, namely, the development into the kind of shallow buttress which is sometimes found enveloping the entire angle in Early Gothic buildings. It makes an exceedingly strong and satisfactory feature. When angle piers were used alone in Gothic times—that is, without buttresses—they were generally octagonal in form, and surmounted, or intended to be surmounted, by pinnacles. In Renaissance architecture angles were more frequently finished with piers than with any other feature. Sometimes these piers are of considerable projection, and stop the majority of the architectural features, the main cornice alone breaking round them. But, as a rule, the pier is of slight projection, and all the horizontal features are carried round it, except the upper part of the main cornice, under the corona of which it stops. Sometimes the piers are panelled, sometimes only broken by niches; more frequently they are rusticated or broken up into groups of pilasters. Strange to say, a rusticated pier does not seem to destroy the scale of a design in the same way that rusticated quoins do; probably because it is evidently a separate feature. These piers gain, like most other angle features, by being a little set in from the actual corner. Piers treated as regular pilasters with caps and bases generally look out of place if there is nothing to suggest the pilaster-form in the rest of the design; but their use was quite common in such cases. On the other hand, at the end of a façade in which pilasters or columns are introduced, a pilaster or a group of pilasters forms the natural and most satisfactory angle. A pilaster placed absolutely upon the angle is to be avoided; because when both sides of the angle are seen, it looks clumsy and ill-proportioned. For this reason the obvious expedient of coupled pilasters is also unsatisfactory if they are set right upon the angle; but if they are set in, so that the angle shows, or even if the outer one of each couple only just meets the other, without their becoming two sides of the same, then the objection falls to the ground. It is an interesting, and not an easy, exercise to design a group of pilasters, or pilasters and columns to terminate a façade and get happily round the corner. The chief things to avoid, besides weakness, are columns or pilasters actually at the angles and any excessive projection of the cornice. The twisted-cord moulding sometimes used in Egyptian and in Venetian buildings marks the angle well enough, but it has an intolerable resemblance to an upholsterer's cording on the cushions of a chair or couch, and is entirely beneath notice as an architectural feature in such a position. There is not the same objection to the roll-moulding that one often finds on the angles of Early Gothic buildings, especially on the buttresses. The roll is cut into the solid angle, and not stuck on outside it, and it gives some fine sharp lines of shadow. A chamfer on the angle of any important feature is seldom or never an improvement; it weakens the line, and destroys its sharpness without giving any sort of compensation. The larger angle features may all be grouped under the heads of turrets and pavilions. Angle pavilions are an invention of Renaissance architects; while turrets, though they continued to be used in the later period, are an essentially Gothic feature. Angle pavilions, as elements in a composition, are, more often than not, made subordinate to a larger feature of the same kind which occupies the middle of the main face of the building; while angle turrets more generally terminate façades or faces which have no very large or prominent central feature. It is also noticeable that turrets are not such effective terminal features for long façades as for short ones, unless they have almost the proportions of pavilions. With respect to circular and polygonal turrets on the angles of buildings, it is a common fault with inexperienced designers to put the centre of the circle or polygon actually on the angle. The centre should be well within the angle, and it does not matter how far within, as long as the angle does not come out beyond the turret. This is a matter to be particularly noted in the case of turrets carried on corbels, like many of those in the chateaux of the Loire district, as well as the little turrets on the angles of some of the Scotch castles. The same observation applies to circular and polygonal bays and oriels on angles, if people must have such things. I have ceased, however, to believe it possible to design one that can be tolerated, unless it is carried up to the roof, and made more or less into a turret. Large towers have, rather commonly in modern buildings, been used at angles. But as anything that can be called a tower must be a very prominent feature, it will overtop any building to which it is attached. It is, therefore, ridiculous to put it at the extreme corner of a composition where, from most points of view, it makes the group altogether one-sided, and from the most favourable point overwhelms the rest of the building. If there are other towers in the group it is a different matter; but a single tower is the most that the majority of us are likely to have to deal with at present. Something remains to be said about rounded corners and angles that have to be cut off for convenience at the corners of streets, and so on. The principles involved in dealing with them both are identical. They present a peculiarly difficult and dangerous problem to the architect, who, if he has any ambition, is sure to see in them his opportunity for doing something original and effective. The problem, too, is generally complicated by the temptation—sometimes it is the necessity—to put an entrance in the angle. But all openings in or near angles must weaken them; and an important opening in a curved surface is a horrible thing to deal with—the head of it must overhang. These difficulties are seldom overcome with any sort of success. As to the entrance, the natural and unavoidable weakness of the opening is too often aggravated by making it arched or by surrounding it with light ornament. The best way to deal with these rounded and canted angles is to treat them as short fronts with the angle features

on each side of them. If the special feature is inevitable, it should be made to stand firmly, as a well-proportioned feature of itself, having but little connection with the rest of the building, which should be finished with its own terminal features on each side of it.

A short discussion followed, and a vote of thanks was accorded Mr. Baggallay for his paper.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—LVII.

By Henry Lovegrove, F.S.I., Surveyor.

WINDOWS.

WINDOW TO CLASS-ROOMS.

ft.	in.	ft.	in.	
2	4 3			
	1 2			
	1 3	12	4	Stone and all labour in window-head.
4	11			
	1 2			
	3 6	14	11	Do. in jambs as before.
2	3 9			
	1 2			
	1 9	8	9	Do. in sill as before, but stools for jambs only.
2	4 0			
	1 5			
	6	5	8	Do. in moulded string under sill.

GROUND-FLOOR.—THREE-LIGHT WINDOW IN FRONT.

2 10	6			
	1 2			
	1 0	24	6	Stone and all labour in sunk moulded and rebated window-heads.
4	11			
	1 2			
	7 9	32	11	Do. in moulded and rebated jambs.
4	1 8			
	1 2			
	6	3	11	Do. in do. sunk and moulded for transom.
4	6			
	1 0			
	7 9	15	6	Do. in mullion moulded and double rebated.
2	7 6			
	1 0			
	6	7	6	Do. in transom do.
2	9 6			
	1 2			
	1 0	22	2	Do. in sill with stools for jambs and mullions.

FOUR-LIGHT WINDOW.

	12 6			
	1 2			
	1 0	14	7	Stone and all labour in sunk moulded and rebated window-head.
2	11			
	1 2			
	7 9	16	9	Do. in moulded and rebated jambs.
2	1 8			
	1 2			
	6	1	11	Do. in do. sunk and moulded for transom.
2	6			
	1 0			
	7 9	7	9	Do. in mullion moulded and double rebated.
	10 9			
	1 0			
	6	5	4	Do. in transom do.
	12 9			
	1 2			
	1 0	14	10	Do. in sill, with stools for jambs and mullions.

WINDOWS TO PORCHES.

2	3 3			
	1 2			
	8	5	0	Stone and all labour in sunk moulded and rebated window-head.
4	8			
	1 2			
	2 6	7	11	Do. in moulded and rebated jambs.
2	3 7			
	1 2			
	1 0	8	4	Do. in sill as before, with stools for jambs only.

SINGLE-LIGHT WINDOWS—SIDE ELEVATION.

2	4 0			
	1 2			
	1 0	9	4	Stone and all labour in sunk moulded and rebated window-head.
4	11			
	1 2			
	6 0	89	10	Do. in moulded rebated jambs.
2	5 0			
	1 2			
	6	5	10	Do. in sunk moulded and double rebated transom.
2	4 0			
	1 2			
	1 0	9	4	Stone and all labour in sill as before, with stools for moulded jambs.
5	3 0			
	1 2			
	1 0	17	6	Stone and all labour in window head as before.
5	3 3			
	1 2			
	6	9	4	Do. in transom as before.
5	3 0			
	1 2			
	1 0	17	6	Do. in sill as before.

TWO-LIGHT WINDOWS IN CLOAK-ROOM AND TO BOYS' SCHOOL.

5	7 4			
	1 2			
	1 6	42	9	Stone and all labour in sunk moulded window head with mullion.
10	11			
	1 2			
	7 9	82	8	Do. in moulded and rebated jambs as before.

ft.	in.	ft.	in.	
10	1 8			
	1 2			
	6	9	8	Stone and all labour in sunk moulded and rebated jambs for transom.
5	4 9			
	1 0			
	6	11	11	Do. in sunk moulded and double rebated transom.
5	7 3			
	1 2			
	1 0	42	4	Do. in sill as before, with stools for jambs and mullions.

WINDOWS AT BACK.

6	3 3			
	1 2			
	1 0	22	9	Stone and all labour in sunk moulded window head to lavatory.
12	11			
	1 2			
	6 6	71	9	Do. in moulded and returned jambs.
6	3 3			
	1 2			
	5	11	5	Do. in sunk moulded transom.
6	3 6			
	1 2			
	1 0	24	3	Do. in sill with moulded stools for jambs.

TWO-LIGHT WINDOW.

(N.B.—Timsed with the window to cloak room).

4	6 3			
	9	18	9	Ex. to relieving arch in Kentish rag facing.
4 2				
	9	6	0	Fair cutting in Kentish rag facing.
4	6 9	27	0	Cir. Do.
4	6 0	24	0	

DOORS—FRONT ELEVATION.

2 2	1 11			
	1 2			
	2 2	19	4	Stone and all labour in door-head worked fair with cir. moulded soffit and sunk joint, and rebated for door frame.
3	2 3			
	1 2			
	1 6	7	11	Do. in centre of keystone of door head, moulded with sunk joints and rebated.
				Carving in plain block letters 3in. high, "GIRLS" on face of keystone.
2 2	1 0			
	1 2			
	4 7	21	5	Stone and all labour in moulded and rebated jambs.
2 2	1 1			
	1 2			
	2 3	11	5	Do. in plain jambs rebated for frame.
				Carving in plain block letters, "BOYS" 3in. high on face of keystone.
2	4 7	9	2	17 by 6 rubbed York bk. jointed step. 4. Sunk fair-jointed ends.
2	4 8	9	4	Centre to flat arch in stone, 14in. soffit with circular angles.

PORCHES.

2 2	2 6			
	2 0			
	2 5	48	4	Stone and all labour in sunk moulded caps and brackets, bosted for carving to pilaster
2	1 9			
	1 2			
	3 2	12	11	Do. in pilasters worked circular on front, and fair on three faces.
2	2 6			
	1 8			
	2 6	20	10	Do. in circular moulded bases.
2	6			
	1 0			
	1 0	1	0	Do. in moulded bracket under eaves.
2	1 6			
	1 2			
	3 2	11	1	Do. in quoins worked circular on front as before.
2	1 8			
	1 8			
	2 6	13	10	Do. in circular moulded base.

COLUMNS.

2	3 3			
	2 0			
	2 5	31	5	Stone and all labour in sunk moulded caps and brackets bosted for carving to column.
2	1 2			
	1 2			
	3 2	8	9	Do. in circular column shafts, with sunk and moulded panel worked on same.
2	1 8			
	1 8			
	2 6	13	10	Do. in circular moulded bases.
2	2 7			
	2 7			
	2 5	32	4	Stone and all labour in sunk moulded cap and brackets bosted for carving to column at angle.
2	2 0			
	1 2			
	3 2	14	9	Stone and all labour in circular column shaft, with two sunk and moulded panels on each.
2	1 8			
	2 6			
	2 6	20	10	Do. in circular moulded bases.

BUTTRESSES.

2	2 6			
	1 9			
	6 0	52	6	Stone and all labour in quoins worked fair 3 sides to buttresses.
2	2 6			
	2 1			
	2 0	20	10	Do. in moulded weathering to buttresses set in cement.
2	2 6			
	2 0			
	1 3	12	6	Add.
2	2 6			
	1 5			
	2 3	16	0	
2	15 7	31	2	12 by 7 York stone, rubbed and back-jointed step to entrance porches, including all joints.

ft.	in.	ft.	in.	
2	6 11	13	10	Add.
2 3	1 4	8	0	Cir. sunk face to 7in. step to fit bases of column. 8. Fair jointed ends to 12in. by 7in. step.

CHIMNEY CAPS.

2	7 6			
	2 6			
	1 3	46	11	Stone and all labour in chamfered chimney capping set in cement, including all cramps, &c., sunk perforation for flues 14in. by 9in.
	3 6			
	2 6			
	1 3	10	11	Add.
2 2	1 1			
	1 1			
	10 6	49	3	Stone and all labour in quoins worked fair, two faces to chimney stacks.
2 2	1 1			
	1 1			
	17 6	82	2	Stone and all labour in quoins as before.
4	1 1			
	1 1			
	14 0	65	9	Add. 2. Extra forming apertures through 14in. stone parapet wall 9in. diameter, and turn arch over same in stone for exit of rain-water.

CHIMNEYPIECES.—IN CLOAK-ROOMS.

	4 0			12 by 4 B. stone shelf worked fair, moulded on front edge, back-cut and pinned into wall. 2. Ends with quadrant corners S. moulded. 2. Moulded brackets out of 9in. by 3in. by 9in., front edge moulded, let into mantel at back.
2	1 6			
	9			B. stone and all labour in mantel with
	1 5	3	2	segmental moulded soffit.
	1 6			
	9			
	1 4	1	6	Add.
	2 1			Segmental centre to stone arch 9in. soffit
2	1 4			
	9			Bath stone and all labour in S.
	3 0	5	9	moulded jambs. 2. Wrot. iron ornamented rests for fire-irons let into stone jambs and run with lead to design.

BOYS' CLOAK-ROOM.

	4 6	4	6	12 by 4 B. stone shelf as before. 2. Ends as before. 2. Moulded bracket.
2	1 10			
	9			B. stone and all labour in mantel as
	1 5	3	8	before.
	1 6			
	9			
	1 4	1	6	Add.
	2 1			Segmental centre as before.
2	1 4			
	9			B. stone and all labour in S. mould
	3 0	5	9	jambs. 2. W.I. ornamental fire-iron rests as before.

CHIMNEYPIECES IN SCHOOLROOMS, &C.

10 2	4 6	90	0	12 by 4 Bath stone shelf as before. 40. Moulded returned S.E. as before. 40. Moulded brackets as before, cut and pinned into brickwork.
12	2 1			
	4½	9	9	Segmental arch in cement to fireplace opening in two half brickwork rings.
12	2 3			
	9	20	3	
12	2 1	25	0	Centre to do., 4½in. soffit.
12 2	2 0			
	3 0	144	0	1½ B. ddt. for fireplace openings. 24. Flues c.p.
7	3 0			Red paving tile hearths bedded
	1 6	31	6	and jointed in cement and concrete filled in and bevelled to receive same over trimmer.
7	2 0			
	1 2	16	4	Add.
7	3 0			
	1 8	35	0	Half-brick trimmer and centring.
7	3 0	21	0	F.E.S.
7	3 0			
	1 6	31	6	Tile hearths as before, and concrete
7	2 0			filled into fender walls and levelled.
	1 2	16	4	
12 2	3 6	86	0	W.I. chimney, with ends split and turned up and down. 14. Rendering with cement chimney-backs.

The statue of William III., which is to be placed on the top of the Clifton-street Orange Hall, Belfast, has arrived in that city from Mr. Harry Hems's atelier at Exeter. The Prince of Orange is represented on horseback; the figure is of bronze, and is 10ft. 7in. in height, and weighs 37cwt. The stirrups, saddle-cloth, and pistol-holsters have been taken from castings of the originals, now in the possession of the Baroness von Staiglitz, and the sword is a facsimile of that which the king wielded at the Battle of the Boyne. The uniform is copied from the costumes at present preserved in the London Tower.

WAYSIDE NOTES.

"A GOOD address!" was the opinion of all whose opinion is worth anything, and who were present at the inaugural meeting of the Institute at Conduit-street on Monday evening last. Enthusiastic, always apropos, unfolding kindly sentiment to all, and hurting none, neither extenuating nor setting down aught in malice. Those who have never had the good fortune to listen to the reading of a dissertation, on matters architectural, by Mr. Waterhouse, have missed something that makes life worth living for, thought the ancient "Goth," as he drank in the modest outpourings of genius, and watched the happy, smiling face, beaming in the soft glow of the familiar reading-lamp, and betraying heartfelt interest in the words and expressions to which the lips gave utterance.

A happy, genial, topical address, such as Mr. Waterhouse has ere now delivered before the assembled Fellows and Associates of the Institute, and one touching upon matters interesting to all. No mention of Registration, though; and perhaps the President was well advised in not addressing the meeting upon a subject with regard to which a stolid apathy and stony indifference is still exhibited by the Institute Council, whatever its individual members may think and feel. Under the circumstances, it was well that we should be thus able to listen to more that Mr. Waterhouse had to say on purely architectural and artistic matters—such as the formation of some parallel body to the Parisian Council-General for Civil Buildings, and a special tribunal for the consideration and settlement of building cases, the education and examination of architectural students, "sky-scraping" offenders, and vast, light-obstructing, "demoniacally"-suspended letters for advertisements—a *sage* remark this, one feels—the apotheosis of the truly beautiful plane-tree, and all the other pleasing topics touched upon, not to mention the highly-interesting personal observations on the buildings of the Paris Exhibition, including our old friend the Eiffel monstrosity. Mr. Waterhouse was better employed on these topics than upon any to a consideration of which the main body of the Institute are for the moment blindly averse. It is, peradventure, left for some succeeding P.R.I.B.A. to find himself compelled by advances made outside the Institute to demonstrate to his audience that the Registration question must either be taken vigorously in hand by themselves, or they must be prepared to suffer possible ignominy upon its being brought to a successful issue by others.

There never has been a more thoroughly popular president of the Institute than Mr. Waterhouse. This I do verily believe. The demonstrative applause that so frequently broke in upon the discourse of Monday night I take to be more than an expression of approval of the sentiments expressed and proposals broached. Rather did they appear to me as evidences of honest pride in the person expressing and broaching them, and as kindly-impatient forebodings of the storm of approbation that arose at the conclusion of the address.

On Tuesday next the inaugural meeting of the Society of Architects for session 1889-90, will be holden at St. James's Hall, upon which occasion the President, Mr. Robert Walker, of Cork, will deliver an address, in which, I make bold to predict, the subject of Registration *won't* be conspicuous there by its absence.

Most practically useful of the many addresses on things architectonic at the National Art Association's Congress in the Scottish capital, was Mr. Thos. Blashill's paper concerning building restrictions by municipal authorities. This is a burning question we must admit, when we remember that not only did it form the subject of more than one lecture to those in congress at Edinburgh; but the President of the Institute in his address dwelt seriously on the continual growing necessity for legislative interference in cases where the greedy portion of humanity intrudes its selfish creations upon, and to the detriment of, the community at large. The old sore is, of course, the tall building difficulty, and the constant fear that we may any day awaken to find that "sky-scrapers" of the true Yankee type have sprung up around us to block out our light, and so much of the breath of heaven as may be able to penetrate, not wholly polluted, through our murky atmosphere; and all to the end of enriching the coffers of some syndicate of capitalists! Mr. Blashill, than whom no one should be more competent to speak on the subject, gave at Edinburgh the various heights to which authorities in different Continental cities allowed buildings to be carried; from which it appears that neither in Paris nor in Vienna can an ordinary street façade attain an altitude of so much as 80ft. Here, in London, a height of 100ft. is a fool to that attained by some of the more mammoth structures erected within recent years. A brighter day for more modest builders in the Metropolitan thoroughfares would seem, however, to be dawning. The necessity for creating new by-laws, restricting the height of London buildings, is being forced upon the attention of our County Councillors by many persons in high places, and by their own architect; and if nothing comes of the Bills introduced to Parliament by private Members, we may rest assured that the County Council must sooner or later take the matter vigorously in hand.

Anxieties and heavy responsibilities innumerable must pertain to the post of architect to the municipal governing body of a vast city like London, and cannot but tell upon any person holding such position. Mr. Blashill, I have noticed, has aged considerably even during the short time he has held the office, and now possesses a snowy crown that must be at the same time both the admiration and despair of the budding practitioner whose youthfulness does not find him favour in the eyes of that section of the British public from which the architect's clientèle is drawn. Though not perhaps the snowiest of the snowy that strikes the eye in a back-view of the Institute assembled in solemn conclave, Mr. Blashill's is yet a contrast to the grey head so familiar to the members of the Architectural Association, before the demands of public business prevented the regular attendance of our revered colleague.

A grey head, a bald pate, or a flowing beard—which should be the ambition of the youthful architect bent on earning fame and fortune? Personally, I don't fancy the bald pate; and an overflowing beard has been associated in my mind from infantile days upwards more with Moses than a great architect. Perhaps the grey head of hair, combined with a well-kept beard of similar hue, is the most becoming style of head-dress for the great guns of the architectural persuasion. It certainly means lucrative business. I have heard of young doctors bleaching their hair grey for diplomatic reasons, but cannot instance any parallel among architects. Nevertheless, the necessity to appear to have had the ripening experience of a cycle of years is as great, or nearly so, in the case of the architect as in that of the physician. A fine face and appropriate style of head-gear, combined with a good address and appearance of years, may be worth an extra thousand pounds per annum to the architect, as it may to the doctor. Not that there isn't room for all styles of face and hair-dressing, nor that, where they exist, the razor should not show us the noble profile, and expressive and deep-meaning lines and furrows. Now that our only knight is clean shaven, and of quite professional aspect, perhaps we shall see a fashion set in of smooth, hairless faces, and flowing head-covering. The only thing is that such a style of face-preparation gives to the naturally good-tempered and genial, a look of overflowing humour, ever suggesting a lurking *bon-mot*, in a way that creates a painful desire to hear something irresistibly funny, scarcely compensated by, say, a wholly unnecessary apology for having been knighted by her Most Gracious Majesty the Queen.

Messrs. G. E. Sears, A.R.I.B.A., and C. Stanley Peach, hon. cor. sec. to the Society of Architects, have in hand a scheme for the registration of builders. It appears to me of much more than ordinary usefulness. If carried through with scrupulous integrity, it cannot but result in a boon to the profession—to both the grey-headed architects aforementioned, and the beardless young practitioners. Perhaps it will be more useful to the latter, since they, getting hold of scamps in the building and contracting line, often have their fingers sorely burnt. The idea of Messrs. Sears and Peach, so far as I can gather from the circular letter they send me, in common with others, is to register a list of builders nominated by architects. Now this I feel it my painful duty to declare won't result in perfection; but it will be a great stride in the right direction, and keep the ball rolling till the builders and contractors fall in with the tendency of the age and register themselves, taking as a model the system employed by the plumbing fraternity.

I believe a proposal was made by the School Board to allow builders to register their names at the offices of the Board. What were the exact terms of this proposal I have not informed myself; but the arrangement seems perfectly fair and just; and if the builders disagree with, refuse, or have refused, to be content with this arrangement, they will get little sympathy from any quarter.

If you receive many more communications like that from Mr. Alexander, which you printed last week, the cause of St. Alban's is lost, for such abuse would make us all quite to sympathise with Lord Grimthorpe, and even ready to enjoy the astounding suavity that permeates his lordship's essay in *Murray* on "Church Restoration Principles!" What next? I suppose, by the bye, you will be giving us an interesting law report next week, unless, as is only too probable, the legal machine has been delayed after the quite usual manner. GOTH.

CHIPS.

The new church of St. Paul's, Fulflood, near Winchester, was opened on Friday. It has been added to a chancel built seventeen years ago from a design by Messrs. J. Colson and Son, in the Early Decorated style, and consists of nave, chancel, and transepts. The total length is 111ft., and 58ft. across the transepts. Flint and stone are the external materials, and the church will seat 400. A porch and tower may some day be added. The work has been done by Messrs. Carter and Son. The total cost is £3,422.

A new station on the London and Brighton Company's service was opened on Monday at West Worthing to serve the needs of the rapidly developing district westward of the town of Worthing. The station has a wide subway connecting the up and down platforms. It is built on a portion of the West Worthing estate, which is being laid out by Messrs. J. W. Hobbs and Co.

Messrs. Mainzer and Kempthorne, artists and workers in mosaic, have removed their offices and works to more commodious premises at 18, Berners-street, Oxford-street, W.

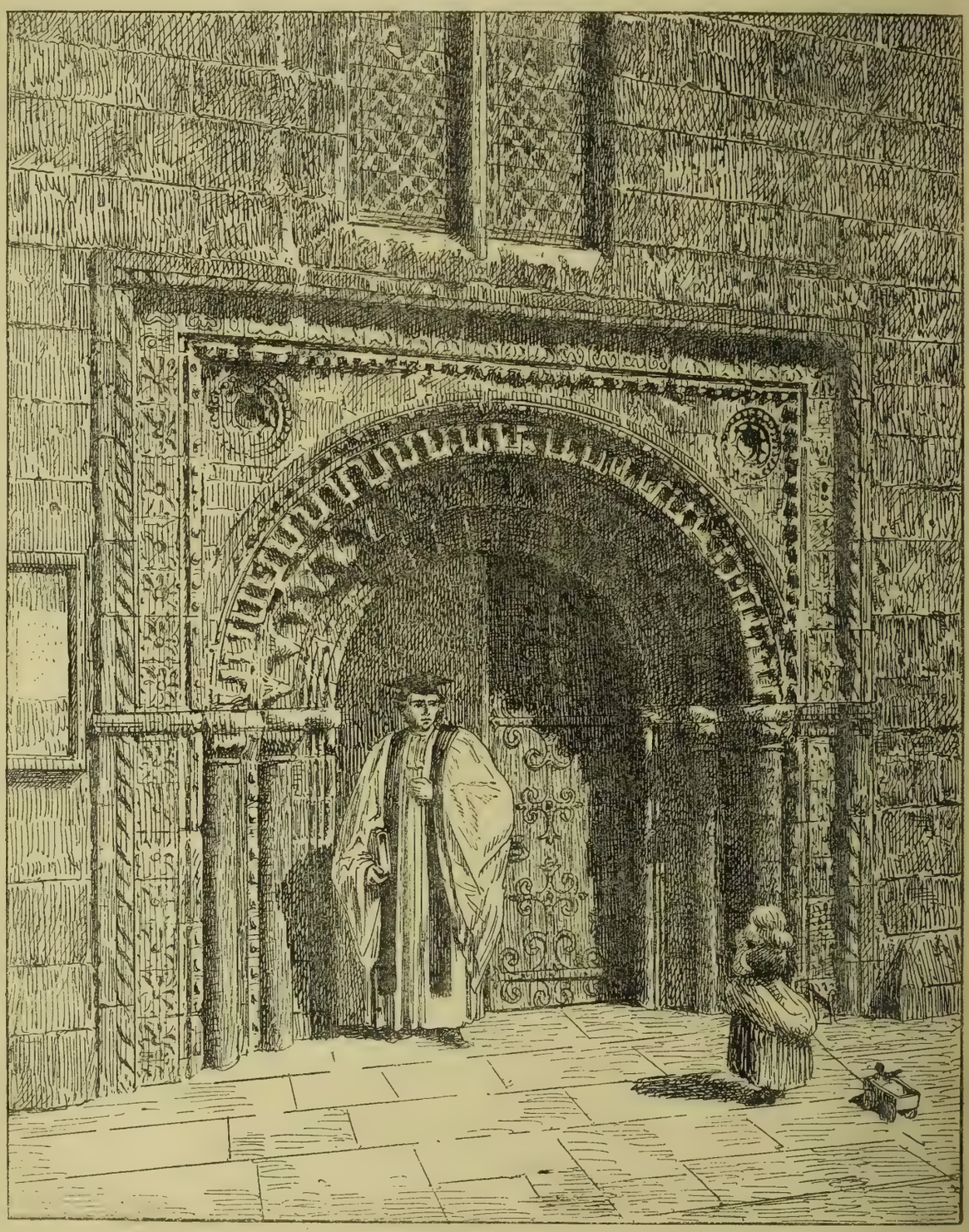
The Mayor of Oswestry laid on Monday the first stone of the new reservoir about to be constructed at Penygwelly, about six miles from Oswestry, among the hills on the Denbighshire side, the source of the present supply, for which the new reservoir will provide additional storage. Mr. Henry Rofe is the engineer, and Mr. James Bolton the borough surveyor.

On Thursday in last week the Bishop of Peterborough dedicated the galilee in the chapel attached to Uppingham School. This galilee—an addition to the west-end of the chapel—is part of the memorial of the late Rev. Edward Thring, formerly head-master of Uppingham School. The architect was Mr. Arthur E. Street, M.A., of London, and the work has been carried out by Messrs. Parnell and Son, contractors, of Rugby, who are also engaged in the erection of the new main school buildings. Mr. Richard Evans is the clerk of the works. The galilee provides 90 additional sittings, and in it will be placed a statue of Mr. Thring, now being executed by Mr. Thomas Brock, A.R.A.

The Windsor Corporation has purchased The Goswells, a meadow on the west side of the town, at a cost of several thousand pounds, to construct a riverside promenade, and otherwise improve the approaches of the Royal borough from the Thames.

The examinations of plumbers for registration were held on Saturday, at the City and Guilds Institute. Applicants were present from various parts of London, as well as from Somerset, Devon, Essex, and Kent. The examinations embraced tests of joint-making, lead-laying, &c., and a set of questions relating to the qualities of materials, the construction of various forms of house fittings, &c., and the principles of sanitation. Two-thirds of the applicants succeeded in passing the full examinations.

A brass eagle lectern has been given to St. Mellon's Church, near Cardiff, by Mr. Richard Travell, Rumney Court, as a memorial of his late wife, who is buried in St. Mellon's Churchyard. This lectern was among the exhibits of Messrs. Jones and Willis, of Birmingham and London, in the Ecclesiastical Art Exhibition held recently in connection with the Cardiff Church Congress.



P E MASEY. DEL?

KENILWORTH CHURCH—WEST DOORWAY.


New Factory Colchester
for J. Kavanagh Esqre
J. F. Goodey Architect
J KAVANAGH BOOT AND SHOE MANUFACTURER

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ILLUSTRATIONS.

AN ARCHITECT'S RUN INTO WARWICKSHIRE.—NEW MARKETS, SWANSEA.—CREMATION, FROM AN ARCHITECT'S POINT OF VIEW.—HOUSE AT DUNHAM PARK, CHESHIRE.—NEW FACTORY, COLCHESTER.—WEST DOORWAY, KENILWORTH CHURCH.

OUR LITHOGRAPHIC ILLUSTRATIONS.

AN ARCHITECT'S RUN INTO WARWICKSHIRE. (SEE ALSO PAGE 644).

HOLY TRINITY CHURCH, Stratford-on-Avon, from the river to the north, the most interesting of the distant views. Shakespeare's mansion, the "Great House," lies to the right, the garden coming down to river. Interior of Chancel, showing the Mural Monument of Shakespeare. It is on the north wall, a little to the east of the charnel-house door; the group of figures is shown looking at it. The graves of the poet and his family—wife, two daughters, and son-in-law—are below, just within the Communion-rail. Warwick Castle, approach to, showing the Cæsar's and Guy's Towers; the luxuriance of the foliage and the perfect keeping of the grounds make the place almost unrivalled. Kenilworth Church, west door: this Norman doorway is in singular position—Norman towers were not usually at west end of nave. It is an interesting example. Kenilworth Castle, view of "Great Hall," so distinguishing it from a lesser one, from the inner bailey. Like the Hall at Hampton Court, it is raised on a basement.—P. E. M.

SWANSEA MARKET COMPETITION: SELECTED DESIGN.

THE following is the report of the adjudicator, Mr. Alexander Graham, F.S.A., nominated to examine the five sets of selected designs in competition for the New Market Buildings:—The drawings and documents that have been examined comprise the following: "Floreat Swansea," "Plenty," "Prosperity," "Prudentia et Candor," "The Earth is the Lord's, and the Fulness thereof." After a careful and thorough examination of the five designs, I strongly recommend for acceptance the design bearing the motto "Prosperity," as by far the best in respect of plan, general construction, and architectural appearance. The instructions have been complied with, and all the requirements of a general market have been provided. The plan of the buildings is ingenious, and the difficulties of roofing over an irregular site have been skilfully overcome. Light and ventilation, so far as the drawings indicate, are efficiently provided for, and general effects, both internal and external, have been considered. There are a few minor points to which I desire attention should be directed. I therefore venture to make the following suggestions with a view to improvement, merely observing that these minor points do not affect the general arrangement of the buildings or the character of the design. 1. The small gables, except over the main entrance in Oxford-street and Union-street, may be omitted. They are unnecessary and meaningless. The raising of the blocking or attic over the minor entrances will have a better appearance. The centre gable over the main entrance in Oxford-street is not a constructive necessity. The slate roof shown on the perspective view should be carried across from tower to tower. 2. The chimneys from the butchers' stalls, shown on alternate piers as though they were behind the sphere-terminals on the external walls, require further consideration. Unless carefully constructed, the flues in these chimneys will not draw, as the adjacent roofs rise to a height of about 11ft. above them. A small gas-cooking stove in each stall, and a system of hot-water pipes would be preferable, and more economical than stoves or open fireplaces for burning coal, which will cause an accumulation of soot within the roofs. The butchers' stalls should not be less that 11ft. in internal height. The door-shop shown on the section may be omitted, and the ceilings placed at least 6in. higher. The roadway inside the market, at the Oxford-street entrance, should be widened to 14ft. The spaces allotted to the water-closets and urinals (especially near the refreshment-room) are scarcely sufficient. These can be enlarged without altering the general arrangement of the surrounding parts. There is nothing in the drawings to show how these conveniences are to be roofed. The ventilation should be provided for, as far as possible, outside the walls of the market, and with independent roofs and louvres. The system of drainage, which appears to have been well studied, can be improved by a more simple disposition of pipes for surface and roof water as for soil drainage. The chambers allotted to market refuse should have flaps in the external walls for the removal of the refuse. They should be roofed, as far as possible, independently of other roofs, and with adequate ventilation. Respecting the probable cost of the market buildings, in accordance with the design bearing the motto "Prosperity," it should be observed that a printed estimate affixed to the plans, amounting to £16,800, is within the sum named by the Corporation in their instructions to architects. This is a matter for inquiry. There is nothing in this design that makes it more costly than any of the other designs. In most respects the construction is economical, and, with the exception of the gables already referred to, nothing has been wasted in ornamentation. It is a question whether so large a superficial area as 80,000ft. can be efficiently paved, roofed, drained, and fitted for the purposes of a market for the inclusive sum of £17,000.—ALEXANDER GRAHAM, F.S.A., Carlton Chambers, August, 1889.— The authors of the chosen design "Prosperity" are Messrs. J. Buckley Wilson and Glendenning Moxham, joint architects, Swansea, and we illustrate their design to-day. The present market buildings are fallen into decay, and are perfectly inadequate for existing requirements.

CREMATION, FROM THE ARCHITECT'S POINT OF VIEW.—(BY THE ARCHITECT TO THE CREMATION SOCIETY OF ENGLAND.)

Now that cremation is fairly afoot in England, and the long and persistent efforts of such true reformers as Sir Henry Thompson and Sir Spencer Wells are bearing fruit, as evidenced in the establishment and working of the Crematory at St. John's, Surrey, it will soon be for architects to consider the effect of this important change upon their work in the future. It is with a view to calling attention to the architect's interest in the matter that the following suggestions are offered. Laying aside the question as it regards health, and the growing dangers of overcrowded burial-grounds in town and country, let us think for a moment of the disfigurement of almost every suburb in England produced by seizing upon the prettiest spots outside the towns and covering them with acres of hideous white crosses, broken pillars, inverted torches, and all the Christian and heathen symbols than can be thought of, where they seem to jabber and squabble and elbow each other in a general fight for supremacy. Since the modest headstone in the county churches gave place to the fashionable cemetery "monuments," those who survive the dead must cover whole hillsides with hideous white marble atrocities that, in their meaningless and ghostlike whiteness, are the terror of the landscape artist at twenty miles distance! The once beautiful churchyard of Hendon is an example. Eminent men of science are daily pointing out the positive and ever-increasing danger to the living of the growing piles of human remains. In this brief paper it is proposed to point out the artistic atrocities of cemeteries, and to suggest the remedy—a return to the practice of reverently depositing the ashes of our dead within the sacred walls of our parish churches, or precincts, without injury to the health of the living; but with a great accession to the artistic interest of the churches themselves. It may seem unnecessary to point out to the educated architect the endless possibilities of niche and canopy, tabernacle and escutcheon, by which the many bare and unsightly aisles of our churches mights be embellished (under regulation of course, a regards some system of design in each case), and Churchmen should surely welcome gladly that which would once more restore the dead and their record to the fabric of the church in which they worshipped during life, instead of the carting off of the remains to some distant cemetery, where, in many cases the unfortunate relatives are forced—by *competition*—either to erect a Parthenon, or a skeleton having a tussle to get out of a gigantic white marble portmanteau, or a marble angel weeping to think that another soul had gone to heaven—or to leave their honoured dead among strangers to be utterly forgotten. Many a cloister and ante-chapel—many an aisle and transept—at present devoid of all interest, might be made beautiful by the succession of niches and canopied recesses which would be required for the depositing of the urns or vases containing the ashes of the dead, while an infinity of colour might be added in the treatment of these niches or arcades after the manner of the screens of old, and the choicest examples of ancient silver, gold, and glass work might furnish any amount of variety and artistic interest in the vases themselves. Rare and costly work might go to the beautifying of the parish church, instead of the erection of coarse and vulgar white marble monstrosities disfiguring our hill-sides. On behalf of the clergy, it may here be hinted with delicate deference that a return to the ancient custom of depositing the dead in the churches, would restore the burial fees. We will take Westminster Abbey as a typical church. It is already proposed to remove the colossal wax-work exhibition to a new building erected for the purpose. This will be an enormous gain to the building; but it is a great question whether or not at an early date a wise Government will enact that no more festering corpses, however distinguished, are to be laid under the noses of the multitude of people who attend the services. It is doubtful, indeed, if there is any further room for bodies under the pavement, and it is hardly pleasant to contemplate the condition of the soil under such a church. The cloisters, cold, dreary, deserted, as they are at present, could, without any impairing of their architectural interest, be made both beautiful and useful by the introduction of niches or spaces in the walls for the reception of urns containing the remains of honoured Britons within the precincts; while for heroes of the first class the Abbey itself would be still available, provided the pure white ashes—and not the corruptible body—were brought for burial. In many cases, where the introduction of wall niches has been rendered impossible by reason of a complete system of decoration, a cloister or separate chapel, connected with the church, might be erected, and an immense gain, in an artistic sense, would be the result, as our modern churches are confessedly in most cases stark, stiff, and ungainly from the want of those groups of minor buildings that in the Middle Ages so greatly assisted and enhanced the effect of the great churches. We all complain of the want of colour in our churches. The columbaria suggested in the appended sketches might be rich with gold mosaic, carving, and armorial bearings. The architect who feels the dull, dead barrenness of our church walls at present will welcome the prospect of giving increased scale, enhanced richness, and doubly-enhanced colour and interest to the interior of his building, by the adoption of such a system of columbaria as is suggested here, following naturally the adoption of the principles of those who, as Sir Spencer Wells puts it, prefer "purification to putrefaction, cremation to corruption."—EDWARD F. C. CLARKE.

HOUSE, DUNHAM PARK, BOWDON, CHESHIRE.

THE following materials have been used in connection with this house. Red Ruabon bricks for the external facing with Runcorn stone dressings. The external timber-work is of

English oak (not stained, but simply coated with raw linseed oil). The gables and panels are finished in sgraffito work, the ground being of a red colour, and the raised portions yellow. Broseley tiles are used for the roofs and tile hangings to the upper story. This drawing was hung in the last Royal Academy Exhibition.—JOHN BROOKE, Architect.

NEW FACTORY, COLCHESTER.

THIS building is in course of erection for Mr. J. Kavanagh on the site of a recent fire at Colchester, and has a frontage of 95ft. The elevations are of red brick (laid and pointed in Portland cement) and artificial stone. The latter material is also used for the staircases. The building will be heated throughout by steam on the low-pressure system, by Messrs. R. Dawson and Co. The builder is Mr. G. Dobson, of Colchester, and the architect Mr. J. H. Goodey.

AN ARCHITECT'S RUN INTO WARWICKSHIRE.

"Come you to my house?"—*All's Well.*

AMONG the noble men this favoured country has produced, and, thank Heaven, they are not a few, is there one who can be said to approach Shakespeare? Is he not the greatest of the whole, of the whole world's great, the first of uninspired writers?—nay, more, was he not divinely inspired, a veritable prophet or seer? In proud pre-eminence standing alone! Yet how indifferent his countrymen seem to be of this! A statue is erected to his memory in Paris; we in London are indebted to Baron Grant for the seated marble figure placed in Leicester-square, while there is not one in his birthplace or elsewhere. Strange, too, it is how few seem to visit his birthplace! The greater number of visitors there are Americans and foreigners. Possibly many, like myself, intend to go; but as it is a thing which can be done at any time, it is with the many never done at all: So I mused. I had been waiting for years for a "more convenient season" to pay the longed-for visit; but would procrastinate no longer, so, thrusting aside deterring impediments and influences, I determined to make the opportunity. Thus, sketchbook in hand, and accompanied with my son, I one morning last autumn started out resolutely at 5 o' the clock, though the sky was cloudy and threatening, to pay our devoir to the memory of the great poet in visiting his birthplace and last resting-place. There were no conveyances at that early hour to take us to the Euston Station, which was five miles off, so we had to put our best foot foremost. We missed the first train; but at 7.15 were able to utter the established formula, "Now we're off!" and after sundry tiresome changes and delays, approached all-expectant Stratford-on-Avon, the church spire of which—"silent finger pointing to the skies"—had gladdened our eyes and riveted our attention whilst yet miles away. On arrival, as one who "makes the church his chief aim," the first visit of inspection was to Holy Trinity, the parish church. It is exceedingly gratifying that the church so intimately associated with the poet's life and name, the place where he was christened, where "with holy bell been knolled to church," and where, with the members of his family, his remains lie buried, should be such a handsome and interesting structure. The building is said to have been founded in Saxon times, but of the existing structure the oldest part is of the 13th century. At that time the church was erected on a plan then prevalent—nave, transepts, chancel, with tower on the crux. In the 14th century, the aisles with arcades were added. In the 15th century the chancel was rebuilt, with clerestory to the nave, the work to the latter being carried up from the rims of the nave arches; a large west window was inserted, and other insertions were also effected. The top stage of tower, and the stone spire, substituted for a wooden one, were built in comparatively modern times. There was a so-called restoration carried out here some fifty years ago, of the which the culprits officiating might have said, had they come to repentance, "We have left undone those things which we ought to have done, and we have done those things which we ought not to have done." The present effort now made is on quite different lines, I am glad to say. The visitor will be struck with the appearance of the churchyard. It is of large size and ornamented with fine trees, and is remarkably well kept. On the east side runs the Avon, "the current that with gentle murmur glides," adding another charm to the place. On entering the church at the west, we behold a spacious nave and aisles. Eastward, at end of the north aisle, is the Clopton chantry, the old Ladye-chapel, blocked with monuments. At the end of the south aisle was a chapel to Thomas à Beckett. It possesses rich sedilia. Attracted eastward down the nave, we pass under the tower arches, which throw an effective shade between us and chancel brightness still beyond. Then my heart leaps to my mouth, as the saying is, and with moistened eye I catch sight of and recognise on north wall of chancel the mural monument and portrait bust of the divinely great one. I regarded it long and admiringly. I had imagined that the painting in oil-colour of this effigy would present a harsh and crude appearance. I was, however, agreeably surprised, for after scraping off the superincumbent layers of paint, the original tints, now broken and subdued, are natural and pleasing. On the upper part of monument are two boys (*amorini* I suppose the Italians would call them), intended doubtless to represent life and death—the one is flourishing a spade, the other holds an inverted torch with one hand, the other resting on a skull. The whole is surmounted with a kind of coffer, on which is a death's head. The floor just inside the Communion-rail, where I knew the Shakespeare grave must be, was, I found, covered over with matting. I had not, however, come so far as to be now defrauded of my rights as a sightseer, so I went in quest of the verger, and brought him back to uncover the floor. Other visitors had gone away without this satisfaction. A row of large stones here in a line with the monument designate the graves of Shapespeare, his wife, his daughters, and his son-in-law, Dr. Hall. An impudent liberty has been taken with the tombstone of Susanna Shakespeare: a verse, part of the original inscription, has been erased, and the name, &c., of an otherwise unknown person inscribed upon the stone instead. Strange that such a thing should have been allowed! So this interloper cheaply and easily gets celebrity. It will be a great pity if this fraudulent bid for notoriety is allowed to be permanent; the intrusive inscription should be erased, and the original lines, as given by Dugdale, restored without delay. In Shakespeare's time there was a great rage for monumental display, and it is surprising that the poet had not a more sumptuous tomb. Possibly the Puritanical feelings of Dr. Hall were opposed to the expenditure. To this person we may owe the loss of the Shakespearian manuscripts, and how great that loss may be!—the Puritans regarding the playhouse with such intense horror. There has been wild talk of disinterring the poet's remains, with the idea that papers might have been put in his coffin; but as the body, it seems, was not laid in a vault, and as, from the contiguity of the river, the ground is probably damp, there is little probability of anything of the coffin or its contents now remaining. But it strikes me there is a possibility of the little stone coffer or box on the top of monument holding something. The inscription on the poet's gravestone, commencing "Good frend for Jesus sake forbeare," was, I should say, put by his wife, and possibly her own composition; such doggrel cannot possibly owe authorship to the poet. The adjoining charnel-house, with its lugubrious contents, would make the idea of her husband's remains being disturbed very offensive. It is possible that the bones of her son Hamnet would be in this ossuarium, as he died before the family rose to affluence, and was doubtless buried in the churchyard. The grave scene in "Hamlet" indicates how familiar a matter the disentombment of human remains was in Shakespeare's time. The notable verse referred to, though minus literary merit, has nevertheless saved the grave from molestation. The chancel on north side has an alabaster altar-tomb to Dean Balsall, 1491, who rebuilt the chancel. Either the monument was never properly finished, or has been roughly pulled about. Above it on the wall is a singular monument with two half-length figures clasping hands, to Richard Combe and his wife who was to have been—only she died. Against the east wall is a monument, with effigy to Shakespeare's friend, John à Combe. On the south side of east wall is a monument by Rysbach. In south wall are canopied sedilia and piscina. The east window is handsome; it has the remains of old stained glass, and with niches at sides. On the north side of chancel was formerly a vestry, with an ossuarium, vaulted, beneath it. This was destroyed in 1800 by the churchwardens to avoid the cost of repairs. Wheeler, in his history says, it was of the Saxon style, the remains of the original church. We must suppose it as Norman. The lower part of it, with the bones, I should think, would be found *in situ*. The doorway to this building is seen near the Shakespeare monument. It has very large stops to the label, now much mutilated; the one to west evidently figures the giant St. Christopher bearing the child Jesus, a favourite subject in the Middle Ages, and serves to remind one that our giant poet was a Christopher. In his allusions to the work of Christ, he bears him reverently and nobly. The body of the church has has been rightly denuded of the galleries which until lately disfigured it. Yet such is the force of custom that we heard a gentleman lamenting their loss, saying that "the church now looked so naked." It is proposed to remove the organ from north transept and put it over arch at east end of south aisle, to build a new vestry, and so free for seating the south transept, now most improperly used for vestry purposes. So far well. I hope, too, that the missing pinnacles will soon be added to the chancel battlements, and all signs of the former restoration effaced. After viewing now round the exterior, we hurried off to the house in Henley-street, by tradition the place of the poet's birth; but this is necessarily doubtful, for the father, John Shakespeare, had other houses in the street, since destroyed—and as to the particular room, how could it be identified? "A prophet is not without honour save in his own country and in his father's house," and it must have been in the next generation before Shakespeare's fame would induce people to think at all about his birthplace, and when no one was likely to be alive to relate anything about it. The house, now restored, has been terribly mauled about to make it resemble a view taken in 1788. A foolish thing to do, for there is no proof that this was the original appearance. I have seen a photograph, taken during this dire *restoration*, showing a great part of the house actually pulled down! A gable with window was part of this fictitious restoration; but the floor which originally required the window, and was the sole reason for the gable and window, has been omitted! Yet a journal praised the restoration as being "so conservative." If this is conservative, what would a radical restoration be? A pity that people who believed in the identity of the habitation should not have acted on the poet's teaching, and determined "Nought shall disturb this hallowed house." The supposed birth-room—discovered, I suppose, by Garrick—has the original ceiling, and its appearance, along with the walls and glass of windows, covered, and overlaid again, with names of visitors, is singular and amusing. The "relics" are of but little value. What is the use of keeping some juice of the mulberry tree which Shakespeare is supposed to have planted? Much is thought of an old desk brought from the grammar school, at which the poet might have sat. It appeared to me to be of much more recent date. We next went to inspect the foundations of the house bought by the poet for his own residence, the "Great House," or "New Place," the handsomest house in the town, and the one in which subsequently Queen Henrietta Maria stopped. The garden attached is pretty, though certainly not in the style of the 16th century. The Guild Chapel across the road now receives our attention; it is in an untidy and unsatisfactory condition, and deserves judicious repair, &c. The last time it was restored—to use a mischievous, misleading word—an important find of wall paintings was made; but they were again covered up with whitewash. Here, no doubt, the boy Shakespeare would attend service, and perhaps receive schooling also, thus probably got the line in his head, "Keep a school i' the church." What was originally the master's house in the little yard behind the grammar-school is pretty with its grey woodwork and little garden bright with flowers; we sketched it, and recommend it to others.

To my mind, the most interesting thing in Stratford is the Church. I only hope it will not be "restored" away or further injured in any manner. By the way, it is remarkable, both in the case of Shakespeare and Sir Walter Scott, that

ey should have ignored their immense claims distinction as authors, and so much coveted eir appearance to posterity as landed gentry. both cases how futile the effort—in second nerations the lines are extinct!

Having seen the sights of Stratford, we quickly ended our way over the fields to the lesser rine at Shottery—Anne Hathaway's home. y the same by-path doubtless trod, three nturies ago, the eager footsteps of Shakespeare his courting expeditions, thinking "a ousand verses of a faithful lover." He, like any another, was seeking a girl much older an himself. The interesting domicile is a long, w, thatched, timber-framed house, showing re and there filling-in of brickwork and astering, and embowered in jessamine and other mbing plants. It has had repairs, but no storation, and is quite a Birket Foster picture. he bride-room here, as in John Shakespeare's use, is covered, walls and ceilings, with sig-tures. Of late years visitors' books have been pt—a much more satisfactory arrangement. On scribing my name, I found it was in juxta-sition to that of Mary Anderson. This young ly, I was informed, had been there twice, once her own account, and the second time to bring r mother, "Good Mistress Mary," thus show-g her appreciation of the bard, and her own mpathetic and generous disposition, "A avenly effect in an earthly actor." The books ow the autographs of two American Presidents, d of all the chief Transatlantic authors with the mes of Dickens and our own well-known iters; but I saw no titled names or those of e moneyed great. Our sketch of the house was newhat interfered with by the swarm of ildren around us, pressing upon our acceptance segays of flowers, a floral tribute not purely mplimentary, but yet pleasing. The tenant of e house, the last relict of the Hathaway family, idly gave me some cuttings from her flowers the folks at home, and then we started in ste for the railway station, where we snatched mouthful of food, and then *en route* for War-ck. No wonder this castle home of "the eat commanding Warwick," with its many ractions, antiquarian, artistic, and arborial, ould be the favourite resort of pleasure rties. Notably "this castle hath a pleasant t," and the beautifully wooded grounds kept in the most perfect condition, thoroughly glish. The grand old Roman vase in the con-vatory is of itself worth a journey to see. The tle is full of interest. The two towers, Cæsar's d Guy's, are pre-eminently good, the finest cimens of military architecture in the kingdom. e portcullis, we are told, is still lowered at ght. We next went to the parish church to the celebrated Beauchamp Chapel and its numents. It is surprising how well this chitectural gem has escaped during the stormy riods of Revolution and Reformation, though t entirely without injury. The agreements ll existing show that it must have been one of e most sumptuous triumphs of Mediæval art in world. The tomb in middle of chapel to chard Beauchamp, 1439, is richer and better served than any of the Royal tombs at West-nster. The effigy of latten gilt, in most fect condition, lies on an altar tomb of Purbeck rble with canopied niches round holding rty-two statues of angels and weepers in ten gilt. The gilded-bronze hearse over the , which so puzzles people, was to sustain a vet covering in order to keep the dust off effigy. adjoining monument in alabaster to Ambrose dley 1589, is interesting and also very well served. It is remarkable here, as in West-nster Abbey, how the hard marble crumbles to t, whilst the soft-to-work alabaster is com-atively unaffected by time—a pregnant text those who find "sermons in stones." There lso, built against the wall, a rich architectural ction to the famed and much-married Robert dley, 1588, and to the last of his wives. The t window of chapel, with old stained glass, h niches and figures up the main mullions and nd the jambs and head, is quite unique. A y chapel in thickness of wall is very remark-e and seemingly superfluous. It reminds of the secret retreat of Oswald of York, private prayer. There is much old ber-work to be seen in the town, and ably at the hospital; but we could not y for proper inspection. We walked ce to Leamington, got there a cup of tea and x train to Kenilworth. Arrived at the town, leasant walk of a mile and a half brought us to the celebrated stronghold over which the genius of Scott has cast so much glamour. Its chief feature, on, of course, its highest point, is the Norman keep, "high top-bald with dry antiquity," square in plan, and similar to others of the date. The rich remains of the banqueting hall we duly admired, and with a stroll round we reluctantly left. The church at Kenilworth was restored by Sir Gilbert Scott. The west doorway is Norman of somewhat Eastern character, the head having a square inclosure with paterae in the spandrels. There is a low side window or lychnoscope in chancel. It is noteworthy that there are many of these mysterious features in Warwickshire churches, mostly 13th century, as at Temple Balsall, Budbrooke, Norton, Morton Bagot, Studley, and elsewhere. I support the hypothesis that they were for the use of lepers, from which to receive the sacrament, and one must suppose this hideous disease, introduced by the Crusaders, to have been particularly bad hereabouts from the number of these windows. At the lower part of the town we lovingly observed an old stone mansion, but could not wait to sketch it. It would have taken a week to have done all we wanted to. We had to get back to Leamington, and from there take train for town. We reached home late, exultant and not overtired, with good store of pleasant memories laid up for the future, and the satisfaction of having done our duty to ourselves and our "ever-living" poet. We had been out nineteen hours, had travelled by rail over two hundred miles, and journeyed on foot twenty miles at least, had seen, admired, and sketched, so I think it must be admitted we had "displayed the sinewy vigour of the traveller," and made the most of our holiday. PHILIP E. MASEY.

NEW PARISH CHURCH OF ST. MARY, HORNSEY.

THE new church of St. Mary, Hornsey, which was consecrated last Saturday by the Bishop of London in the presence of a crowded congregation, is a large edifice erected upon a site adjoining the old parish church, the ground having been given by the rector of Hornsey. The axis of the new church is in a direction nearly at right angles to the old building owing to the shape of the ground not permitting it to be placed east and west; an unfortunate circumstance, though one that could not be avoided. The plan conforms to the usual type, and has nave, aisles, transepts, the latter being used for the organ-chamber on the north side, both opening into the chancel by arches, and also into the aisles, which are thus terminated at the "eastern" end. Beyond the transepts, which do not project farther than the aisles, are the vestries for clergy and choir. Across the east end, behind the sacrarium, is an ambulatory, which connects the two vestries. A tower and lofty spire are proposed at the west end of nave, which are only foundation high; these, together with the large two-storied porches intended to be built, will form a narthex the whole width of the building. It is intended to be groined, and the springers are already built in; the upper rooms and porches will be used as a parish room and church library. Mr. Brooks, the architect, has in this design departed from his usual treatment, and has adopted a thoroughly English Perpendicular style of the 15th century, the nave having a low-pitched roof and the windows of Perpendicular tracery but varied in design, the north aisle windows being different in detail from those on the south side. The nave and chancel, which together give a total length of 200ft., are continued of the same width and height throughout, much enhancing the dignity and external effect of the church, the ridge level being maintained and the separation of nave and chancel marked internally simply by a richly moulded arch, springing from the walls instead of being carried by responds or corbels. The result is to give width and to carry the eye uninterruptedly onwards to the eastern wall. On the outside the separation is marked by carrying up the wall and coping. The principal dimensions are as follows:—Nave 118ft. by 29ft. 6in., aisles each the same length by 19ft. 9in., north and south transepts 27ft. by 19ft. 9in., chancel 48ft. by 29ft. 6in., height from floor to wall-plate 40ft. 6in., and from floor to ridge 50ft. Tower 26ft. square, and the height to top of proposed spire 182ft.

Internally, the nave is divided from aisles by six arches or bays. The centres of these do not coincide with those of the aisle windows nor the outer buttresses, there being eight windows, while the clerestory windows, five in number, are placed over the spandrels of the arcade. The aisle windows have three lights with cusped heads, and Perpendicular tracery in the heads; the clerestory windows are of four lights, with broken transoms and varied tracery. The nave roof is open-timbered; the trusses have tie-beams and wall brackets, filled in with moulded ribs between the principals, those of the chancel being varied by having no tie-beams. The east window is of seven lights. The inside walls are faced with coursed Ancaster rag-stone, tool-dressed to an even surface, the outer facing being of the same stone, a warm-coloured limestone of fine grain. The body of walls is of Portland cement concrete. The details are well executed. The pillars have moulded caps and bases, and four shafts divided by hollows, these being carried round the arch-moulds. The stalls of choir are of teak, and relieved by panels and stiles of quatrefoils, the gift of Mr. E. W. Nicholls. The pulpit is richly-carved, of Ancaster stone, a memorial to the late rector, Canon Harvey, and his wife, the carving by Earp. The font—octagon, with engaged shafts placed at alternate faces—is the gift of Mr. Hare. The Communion-table is presented by Mr. W. R. Fox, and is of teak and oak; this, and the choir stalls and lectern, were executed by Mr. A. Robinson, of Broad-street, Bloomsbury. The organ is a fine instrument by Messrs. H. Willis and Son, provided with hydraulic power, and cost £2,000, the outer pipes plain metal inclosed by teak carved rails. Chairs instead of seats are provided, and the accommodation is 1,266 persons, the floor being of wood-blocks laid herringbone fashion. We noticed some well-designed wrought-iron gas-fittings suspended from brackets from the nave walls. It is proposed to place figures of Our Lord, the Blessed Virgin, St. John the Apostle, St. John the Baptist, Evangelists, and Early Fathers in niches in the porches and over the heads of doorways. The cost already incurred is about £15,000, and the contractors were Messrs. Rudd and Son, of Grantham, the clerk of works being Mr. J. Spooner, and the foremen Jesse Walton and W. Streather. Messrs. Hart, Son, Peard, and Co. supplied the gas-fittings.

CARPENTRY AND JOINERY.—XXIV.

WINDOW FRAMES AND SASHES (*continued*).

SEMICIRCULAR-HEADED sash frames are comparatively common work for joiners nowadays, and are got up in even many more different ways than segment. One method for the above class of frames is to put them together similarly to the plan adopted for segments, as described in connection with Fig. 163; that is, the same method of construction, the difference being that the curve differs in being a semicircle; but in all other respects the same instructions will apply. The great objection to this plan is, the *spandrel* formed at each side is very dark and dull-looing, only that where such methods are adopted, economy is the great consideration. The *spandrel* could be formed into a panel by cutting it through (that is what forms the parting bead at the head), showing a margin equi-distant from the stile, head, and concave edge; the panel may be screwed on, and of course on the side furthest from the spectator, when the frame is in position, then *plant in* a moulding aronnd to complete the design.

Or a suitable fretwork design may be cut out in the spandrel on each side, and a piece screwed on to show the design and make the framework air-tight. Other methods of ornamenting these spandrels may suggest themselves to the workmen, or other interested party. The semicular heads may be *got out of the solid*, as was described of segments, but the connection with the stiles in the nature of things must be different, and is as follows:

The head is worked in two or three pieces, according to the width of the frame, then at the point where the semicircle begins to spring, the stile is checked out, say about half its thickness, as shown in Fig 165, to allow of the curve having a rest; this is also required on account of the *short grain* owing to the curve. The pattern or template for working the head would be got out to suit this. If the head is got out in two piecet, then a pattern got out for the half

will suit both sides, but if in three, then mark where the joints are to occur, and from the centre draw through these marks the directing lines of the joints. Get out a pattern for one side, which of course should reverse for the other side, and a pattern for the piece required in the centre. It

Fig 165



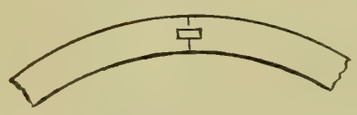
2" Scale

is seen by looking at Fig. 165 that screws are put in through the back of the stiles to hold the curved pieces to, and these screws should be put in so as to draw the curved pieces down, making thereby a close joint.

Fig. 166 shows how the joints of the head are made. A tongue is inserted to keep them *fair* underneath, and also when the pieces are being nailed and screwed together. The heads should be fitted and put together on the board on which the semicircle has been drawn out, and a *stretcher-piece* put across to keep them in position until the head is fastened to the stiles, and even until the inside casings are put on.

Let it be observed the casings should be got

Fig 166

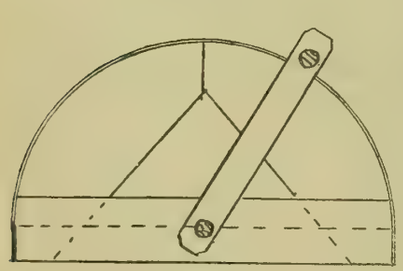


2" Scale

out so that the joints will not all occur in one line in transverse section, as when the joints are broken the curve is better preserved and the frame is much stronger. Sometimes for cheapness the tongue, shown in Fig. 166, is done away with, and the curved pieces just nailed together where they abut.

Semicular heads are also formed by *staving and blocking*; this is done in the following manner. A veneer of sufficient length and breadth is obtained, the section of the stile gives the breadth, and the length is the *stretch out* of the semicircle, which can be obtained by taking $3\frac{1}{7}$ times the diameter and dividing by two; allow a little

Fig 167



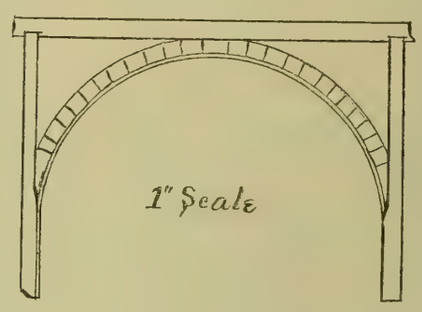
1" Scale

extra, but put on the extreme or springing lines by this calculation.

The veneer will usually be $\frac{3}{16}$in. or $\frac{1}{4}$in.; but this depends on the quickness of the *sweep* and can be tested by experiment; that is, plane a piece to the fancied thickness and try if it will bend round the curve readily; if not, it must be reduced in thickness until it does. The next part of the proceeding is to have a centre (semicular) made to the size required, which should be not only the full semicircle, but should have 1½in. or 2in. extra below the springing line.

Fig. 167 gives an illustration of the centre used in bending the veneer. This centre should be sheeting close and the sheeting should cross the *ribs* which have been got out for the purpose. The *stretcher* of each rib should be, say, 4in. wide. Having made and sheeted the centre, plane the outer side of the sheeting, as any roughness would affect the inner surface of the veneer, then have two laths and two pins (the pins circular), one pin is put through a hole bored in the centre of the semicircle (stretcher), and the laths will have holes bored so as that they can be put on and revolve upon this pin. A hole will be bored in each lath sufficiently far away from the first just to admit of the other pin which is to be put in it pressing the veneer close against the centre. It will be understood that this is a simple kind of bending apparatus. In bending the veneer start with one end, placing the veneer against the centre, then put a piece against the outside of this, say 1½in. or 2in. by ¾in., and screw through this piece and also the veneer into the 2in. extra below the springing line; then work the pin and laths, which should be at the starting end, so as to bend the veneer close against the centre. Then when it has been worked round and the veneer close against the centre, if any portion is slack it must be made close, then screw a similar piece on the finishing

Fig 168



1" Scale

side to that of the starting, when it is ready for the *staving or blocking*. These blocks may be from ½in. to 1½in. or even 2in. wide and one inch or so thick, the length being such as to suit the widths of the veneer; as they are laid across (transverse), the side of the block next the veneer may require to be hollowed a little to suit the curvature of the veneer; but this will depend on the breadth of the blocks. They will also require to be fitted to each other edgeways, that is, the two edges converge to the centre. The blocks may be glued to the veneer when about half-a-dozen or so of them have been fitted; and so on round the curve.

It is, perhaps, just as well to start at each side and finish in the centre. It is necessary that all the timber worked up in this be thoroughly dry, as the gluing will not stand otherwise; and if considered advisable when the blocking has been glued on all round, a piece of rough canvas may be glued on outside of the blocking, first removing any unevenness, if any on the outside of the blocks, by planing. When the blocking has thoroughly *set*, the curve (head of the frame) may be removed from the centre, but before removing it screw on two stretchers across to keep the curve from straightening out, which it will have a tendency to do. It will be found that to screw on these pieces and remove the curve from the centre, it (the centre) can only be as broad across as the stile is wide. The next operation will be to groove this head, which will be done according to the appliances at hand, either by machinery, or by *cutting gauge and router*. When this is done the curve must be fitted to the stiles, as shown in Fig. 165, and when all is ready put in in a similar manner as would be done if it were got out of the solid; the casings tend to keep it right. This method is very suitable for stained work; but a preferable plan to this for stained or polished work is to have, in one continuous length, the piece to make the two stiles and go around the head (semicircular); on this piece put on the lines for the length of the stiles, so as to fit the sill; put on also the springing lines, so as to have the semicircle in the centre, and the stiles on each side; *drop* this piece on to a circular saw, so as to leave the veneer just sufficient for bending, same as above. Cut the portion outside of the veneer, so as to suit for straight stiles to support a square head; then block round as before, after putting a centre in. The stiles should be inserted in the sill, and the square top fastened on; afterwards put on the casings.

Fig. 168 gives a drawing of the arrangement

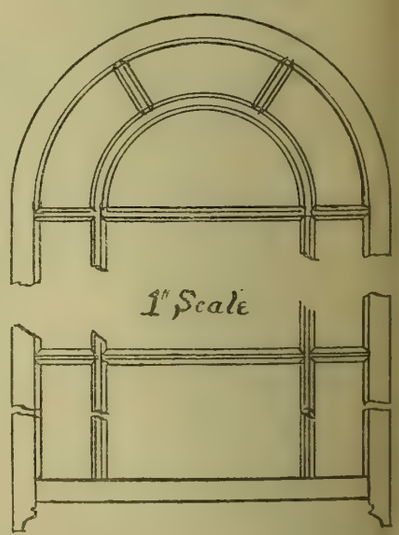
Fig. 169.



2" Scale

described above, which should be readily understood. It will be easily seen that such a frame as the above can be treated or utilised in several ways; if it is desirable to finish the window square inside, then the spandrels may be panelled as described in the beginning of this article; or, if it is necessary to have the window finishing semicircular, then it can be lintelled square, if the *soffit* finishing is to be of plaster, *ground* to suit, or if of wood, the woodwork can be fixed even better with a level lintel. Still, another method may be adopted; the frame can be built in, and the masonry or brickwork semi-circular on each side of the frame, and *tied* together until it rises above the level of the square head of the sash-frame; the frame itself could then have a lintel and the masonry or

Fig 170



1" Scale

brickwork continued as if this cavity containing the head of the frame did not exist.

A few remarks upon semicircular topped sashes. Much of this will be readily understood if the putting together of curve-headed door-frames was clearly grasped. Lay down the working lines of the top sash, get out the patterns for working the curves in two or three pieces, as is deemed advisable, allow the stiles long enough to work a *key* on.

Fig. 169 gives two views in elevation of the *key*. Then, when the curves have been wrought to the shape, rebated and moulded, they can be

jointed on the board on which the working lines are drawn by nailing triangular pieces on the board, as before described, for door-frames. Fit the keys of the stiles into the proper end of each curve; the centre joint can be made by a double key of oak or other suitable hardwood. The working of the *meeting-rail* is similar to that of a square sash; put all together, and drive in the wedges *dry*, so as to test the sash by the working lines; if any joint requires altering, make it right. When the sash has stood some time, and is sufficiently dry, it can be wedged and pinned. In doing so, it would be just as well to have it lying on the board on which the working lines are laid down; but if it has been tried immediately before, it is not absolutely necessary to have it lying on the board during the wedging.

Sometimes semicircular-headed sashes have what is known as a *margin pane*.

Fig. 170 gives a not unfrequent case—say for a staircase window, coloured glass being inserted in the margin, and glass with a geometric or floral design in the centre. To work out the joinery of Fig. 170, it would be advisable to have a part of the curve on each of the stiles of the sash, and one centre piece to complete the head. The two joints would then be made either with joint bolts or double-ended keys (oak); the meeting-rail would be tenoned into the stiles in the ordinary way, the horizontal *bar* would be continuous and tenoned into the stiles. The circular piece of *inside stuff* would require to be worked and then bent, and to do this it will be necessary to steam it, and also, in bending, have a centre of the proper size worked reverse to the moulding and rebate, so as to admit of these fitting in. The mortises could be cut in whilst it is upon the centre (stumped in). The pieces which divide the curved portion of the margin into three equal spaces, and the circular piece of inside stuff, should be tenoned at the ends. The tenons of the circular piece of inside stuff, as also the upper ends of upright *bars*, enter the mortises in the horizonal bar which crosses at the springing line. The other ends of the upright bars are tenoned through the meeting-rail. The joiner who has worked all this so far will have no difficulty in fitting and putting together the whole.

CHIPS.

At Tuesday's meeting of the London County Council in the Guildhall, the Asylums Committee report that after further consideration of the contracts for the execution of the works for the extension of the County Asylum for Pauper Lunatics at Cane-hill, Coulsdon, they had agreed "not to recommend the acceptance of Messrs. Brass and Sons' tender." Inquiries were now being made as to the capacity of some of the other firms who tendered for the work. This recommendation was approved. Messrs. Brass give a general denial to the charges brought against them as to underpayment, with the exception of "the day workmen engaged under the triennial contract for general works and repairs with her Majesty's Office of Works." They also assert that they "have not made any general reduction of wages" during the time mentioned by their accusers. They have also Mr. H. W. Primrose's authority for correcting the allegation as to Mr. Plunket's "intention to cancel the contract, which had, however, unfortunately been signed," which Mr. Primrose says "must have been made under a misapprehension."

St. Swithin's Church, Cheswardine, which, with the exception of the west tower, has been entirely rebuilt, was reopened and consecrated by the Right Rev. Dr. Maclagan, Bishop of Lichfield, on Friday afternoon. Mr. Pearson, R.A., was the architect, and Mr. Whittingham, of Newport, Salop, was the builder.

The Forth Bridge was virtually completed on Wednesday, when, in the presence of a large gathering of spectators, the last bolts were driven connecting the Fife-side and the Inchgarvie girders.

The London County Council resolved on Tuesday to seek power, in their Bill for the Strand improvements, to require the owners of property likely to be benefited to contribute to the cost in proportion to the enhanced value of their property due to the improvement. They also determined to call the attention of the Local Government Board to an existing injustice in requiring chapels to contribute to the making and paving of new streets, from which charge churches of the Establishment are exempt.

The will of Lady Jones, widow of Sir Horace Jones, the City Architect, late of 9, Salisbury-road, Hove, Brighton, who died on September 9th last, was proved on the 24th ult., the value of the personal estate amounting to £2,046.

Building Intelligence.

Bristol.—The enlarged general post-office at Bristol was opened on Monday. The new wing gives the building a total frontage of 135ft. to Small-street, broken through on the ground floor by an archway leading to a courtyard for mail carts. The public hall is 51ft. by 44ft., and the height is 15ft. The counter is nearly 100ft. long. From the public hall there is an entrance to a parcels room, and at the rear of this is accommodation for letter carriers. The present money-order office will be the carriers' kitchen, and will be connected by a staircase to a room above. The apartments provided on the first floor of the new building include a large general dining-room for the staff, and a smaller apartment for superior officers, with a cloak-room adjoining. Near by is the new returned letter department. The new building was erected by Mr. A. J. Beaven, from designs by Mr. E. G. Rivers, H.M. Office of Works, Bristol.

Clapham.—The new Free Public Library at the corner of Orlando-road, Clapham Common, was opened on Thursday in last week. The façades are of red brick, with Box Ground Bath stone dressings, the ground area occupied being 105ft. by 60ft. The Common front has a fore-court, bounded by iron railings surmounting a coping, and interspersed with red brick piers. From the entrance hall the visitor passes into the borrowers' lobby, and the counter has a Cotgreave's indicator, showing what books are in use and what are available. This borrowers' lobby is paved with wood blocks, and is lighted with Wenham gas lamps. Behind this lobby, and without any structural separation, is the issuing-room or lending library, with accommodation for 27,000 volumes. This receives its light from above by three lantern lights, while all around the walls are shelves, and in the centre are cases. From the borrowers' lobby swing doors open into the news-room. At the rear of the news-room is the reference library. This is approached through the news-room by means of swing doors. Behind the issuing-room are a commodious librarian's office, a binding-room, a file-room, lavatories, &c. The staircase in the entrance hall is of Portland stone, with ornamental iron railings and polished mahogany. From the landing an entrance is obtained through large swing doors to a museum 45ft. by 24ft., which extends over the entire front of the premises. Boyle's patent ventilators are used. Ample accommodation is provided for the librarian, and a suite of rooms extends over the hinder portion of the premises, with a separate entrance from Orlando-road. Mr. Edward B. I'Anson, whose design was selected in competition, is the architect. Messrs. Kynoch and Co., of High-street, Clapham, took the contract at £3,865; and Mr. A. Langton has acted as clerk of the works.

Kensal Town, W.—A new Church of St. Thomas has been erected at the corner of Kensal-road and East-row. The sum of £2,713 has been devoted to the building as part of the proceeds of the sale of the site of the "Church of St. Thomas Within the Liberty of the Rolls, Chancery-lane," which, together with a number of parishioners' houses, was razed to the ground to make a thoroughfare into Fetter-lane. The new church consists of nave, with north and south aisles, transepts, chancel, vestries, organ-chamber, baptistery, porch, and heating-chamber, and will accommodate 600 people. The walls are faced with Lincolnshire red brick, both inside and out, with Bath and Doulting stone dressings. The roofs are covered with green slates, and there is a lofty bell-turret rising from the ridge over the chancel arch. Internally the roofs have boarded and panelled ceilings, while the ceiling of the chancel is vaulted in wood. The floors under the seats are of Gregory and Co.'s solid burnetised wood blocks. The chancel fittings are of oak. Part of the scheme is to build a parish room and Sunday school on the ground to the south of the church. The architects are Messrs. Demaine and Brierley, of York, whose design was selected in competition. Mr. W. T. Creed has acted as clerk of works. Messrs. Thos. Gregory and Co., of Clapham Junction, are the builders, represented by Mr. Isaac Newton as foreman. The cost of the new church will be about £6,000.

Liverpool.—The new Walker Engineering Laboratories of University College, built at a cost of £20,000, borne by Sir A. B. Walker, were opened on Saturday. The architect is Mr. Alfred Waterhouse, R.A., and the contractors were Messrs. Brown and Backhouse. The laboratories consist of a building of three stories, attached to another of one story, the latter being the wood-working department. The main building is three floors in height, and is faced with terracotta and grey brick, of which the whole of the future college buildings will be constructed, and of which the new infirmary, as well as the chemical laboratories, are already built. The walls of the entrance hall are decorated with faïence work, and the floor pavement is of mosaic pattern. In the main laboratory is the testing machine, manufactured by Messrs. Buckton, of Leeds, and capable of not only breaking a specimen of the force of 100 tons, but, by means of a special contrivance, of testing equally the finest and most delicate work. There is a milling-machine for cutting iron and steel, a planing machine, and also a number of lathes, a cutter grinder, a grindstone, &c. All the machines in the place, as well as the dynamo for the electric lighting, is driven by a vertical engine of 40H.P. The boiler-house is reached through a door by the experimental engine. Ascending the broad stone staircase, the first floor is reached. Here there is a large museum, and adjoining a lecture hall, for 130 students, each of whom has a raised desk, the lid of which also serves as a small drawing board. On the same floor are the private rooms of the professor of engineering, the experimental laboratory, and large class-rooms. The mezzanine floor contains a well-lighted diagram room and a gallery, which overlooks the museum. Above the mezzanine room are placed one class-room, also rooms for work and a reading and two private rooms for lectures. A large room for drawing occupies the whole length of the building. On the floor above and here are also special photographic rooms for the preparation of lantern slides and of the blue prints required in engineering drawing.

Pelsall.—The new portion of the parish church at Pelsall was consecrated on Monday. The church has been enlarged and improved by the addition of a new chancel, with vestry and organ chamber. Originally a small recess did duty for a chancel, and the organ and choir were located in the west gallery. The new chancel is 21ft. long, 19ft. wide, and 28ft. high, opening into the church with a richly-moulded stone arch, the full width of the chancel. The organ chamber is on the south side and the vestry on the north. The new work is of plain red bricks, with Hollington stone arches and windows to match the older portion. Internally the roof is open-timbered in pitch pine, and the floor laid with Maw's tiles. The stalls, altar rail, altar, &c., are of new oak. The east wall is pierced with a five-light window, the sill of which is raised sufficiently for a reredos to be fixed in future. The work has been carried out at a cost of about £600 by Mr. Wootton, of Bloxwich, under the superintendence of Mr. T. H. Fleeming, of Wolverhampton. The new organ which has been erected is by Messrs. Nicholson and Lord, of Walsall, and has cost about £180.

The new Wesleyan Chapel, erected at a cost of £2,000 upon the site of the old building at Westbury-on-Trym, was opened on Friday. The chapel and schools are of Early English design, and are built of Pennant stone, with Bath stone dressings. Besides the chapel, there is a large schoolroom, two classrooms, and vestry. A tower and spire some 80ft. in height form a feature of the building. The chapel will at present seat 300 persons, and the fittings are of varnished pitch-pine. The roof is of half-open construction, lined with varnished deal, the principal timbers resting on Bath stone dwarf columns, on carved corbels. The windows have traceried heads, and are glazed with cathedral glass. Mr. Herbert Jones, M.S.A., of Bristol, is the architect, and Mr. T. R. Lewis, of Hotwells, is the contractor.

The large works of Messrs. J. and G. Meakin, Eagle Potteries, Hanley, are now illuminated with the electric light, the work having been carried out by Mr. Joseph Blackburn, Gresham Works, Nottingham, who has also received instructions to light up the new pavilion and entrances now being erected at Nottingham, to accommodate upwards of 12,000 people to be addressed by the Marquis of Salisbury on the 26th inst.

The Chute memorial brass has this week been placed in St. Stephen's Church, Bristol. It was designed by Mr. G. H. Edwards, architect, of that city, and executed by Mr. W. H. Baker, also of Bristol.

COMPETITIONS.

Blaengarw.—For a new church about to be erected at Blaengarw a limited number of architects were invited to send in competitive designs—viz., Messrs. Seddon and Carter, Messrs. Halliday and Anderson, Messrs. Bruton and Williams, Mr. E. Lingen-Barker (of Hereford), Mr. Bruce-Vaughan, and Messrs. Lambert, E. W. Burnett, and Philip Thomas. After consideration three designs were selected, and on Tuesday it was definitely decided to appoint Messrs. Bruton and Williams, of Cardiff, as architects. Accommodation will be provided for 300 persons, with space reserved for extension on the north side.

Chelmsford.—A meeting of the governors of Chelmsford Grammar School was held on Wednesday week to finally decide on plans for the new building. Of the 13 plans which had been sent in in competition four had been selected for further consideration. These bore the mottos of "Salus," "Lux," "Straight and True," and "E. R." The governors now examined these four sets again, with the result that those of "Salus" and "Lux" were decided against, the first on account of the probable expense, and the second because they they were not liked sufficiently. A vote was taken on the remaining two sets, when, by eight to one, those endorsed "Straight and True" were adopted. The successful architect is Mr. H. A. Cheers, of Twickenham, who guaranteed that the work could be carried out and completed for £4,000. "E. R.," who held the second position, is Mr. F. Whitmore, of Chelmsford. The adopted plans place the school buildings in the centre of the north side of the site, with trades', boys', and principal entrances from the West Market-road. The class-rooms, with schoolroom over, are on the west side of the block. The laboratory, 24ft. by 18ft., is detached by an open porch, and is partly lighted from the top. Adjoining are the latrines. A principal entrance hall, for boarders and visitors, is provided. The boarders' dining-hall has a service-room and pantry, and there is a master's house. The architect has provided for a detached building containing a laundry, washhouse, and drying-room, and a sick-room and room for nurse adjoining, on a southern aspect. The design is Tudor in character, the suggested materials being red brickwork and stone.

CHIPS.

A monument to the memory of the late Archbishop Ullathorne has just been erected over his place of sepulture in St. Dominic's Church, Stone. It stands in St. Joseph's Chapel, occupying the south transept of the church; and consists of an altar tomb surmounted by a recumbent effigy of the deceased. On the tomb are panels containing the arms of the diocese of Birmingham and those of the Benedictine Order. The effigy represents the Archbishop clad in full pontificals, and bearing a crosier; the head is supported by two angels, and the right hand is raised in benediction. The design was furnished by Mr. Joseph Hansom, and executed by Messrs. Wall and Co., of Cheltenham.

During the high wind on Saturday week a serious mishap occurred at a new Volunteer drill-hall in course of construction in St. Mary's-road, Southampton. The work has been pushed on by the contractor, Mr. Jonas Nichols, who had got the walls up to a height sufficient to allow the roof, which is constructed entirely of iron and glass, to be proceeded with. The end wall facing the north-west, and weighing something like 100 tons, was brought to the ground, together with the scaffolding. The wall was 80ft. long, 36ft. high, and 14in. in thickness. Mr. W. H. Mitchell, of Southampton, is the architect.

The Free Church of Musselburgh was reopened on the 31st ult., after rebuilding from plans by Messrs. R. T. Shiells and Tomson, of Edinburgh, at an outlay of £2,500.

A new art, science, and technical school was opened at Bingley last week by the Master of the Clothworkers' Company (Mr. Wyatt Papworth, F.R.I.B.A.) In the evening a meeting was held in the Mechanics' Institute, at which Mr. Papworth delivered an address on "Decorative Art in Relation to Technical Education."

After undergoing structural repairs, under the supervision of Mr. Ernest Flint, architect, and being also cleansed and redecorated, the church of St. Peter, on Cornhill, one of Wren's works, was reopened for worship on Sunday.

The tender of Mr. Shiner, of Chatham, has been accepted at £1,395 for a group of British schools about to be built in that town.

Engineering Notes.

Cambridge.—The foundation stone of the new roadway bridge over the river Cam and approaches, Chesterton, Cambridge, was laid on Monday last. The superstructure is constructed of iron and steel, and consists principally of six elliptical main ribs built up of wrought-iron plates and angle iron, and firmly braced together with diagonal and horizontal cross bracing of channel iron. The foundations of the bridge differ on each side; on the Chesterton side good solid clay is found at a depth of 15ft.; on the Cambridge side the bed of the old river was found, and as the clay was not reached until about 30ft. below the top ground level, the engineers had to pile the substrata to obtain a good foundation for the abutments, in preference to excavating down to the solid. The abutments and retaining wall are built of Darley Dale stone facing, with Portland cement concrete backing. The new road (across the Midsummer Common) will be 40ft. wide with two footways of 7ft. wide on either side, and properly drained. Cast-iron rail fencing will be laid on each side of the road, the roadway of the bridge and approaches will be of granite macadam, and the footings of granolithic pavement. The engineers for the work are Mr. John J. Webster, M.Inst.C.E., 67, Lord-street, Liverpool, and Mr. Frank Waters, 1, Sidney-street, Cambridge; the sole contractor is Mr. John Mackay, of Bury St. Edmund's. The clerk of the works is Mr. G. McNeil. The cost of the whole of the works will be about £10,000, and they are to be completed next June.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Royal Institute of the Architects of Ireland.—A council meeting was held at 37, Dawson-street on Monday last, Mr. T. Drew, R.H.A., in the chair. The subject of the preliminary examination was taken up, and it was decided that this examination should be held at the same time as that of the R.I.B.A. next week, and that the examining board should be Messrs. Thos. Drew, J. R. Carroll, R. Millar, and Albert E. Murray (hon. sec.). A special council meeting was directed to be summoned to nominate the officers for election for 1890, to consist of president, hon. sec., and treasurer, of council, and auditors.

Sheffield Society of Architects and Surveyors.—The inaugural meeting of the session of this society was held at the Montgomery Hall, Sheffield, on the 28th ult. The President (Mr. Frederick Fowler) delivered an address. He expressed an opinion that much good was being done by societies such as theirs, which were, he was glad to note, on the increase. The Sheffield Society was doing a good work in alliance with the R.I.B.A., by carrying out the examination scheme. In these days it was absolutely necessary that professional men should be well acquainted with their business, and much might be done in this direction by the preparation, reading, and discussion of papers by the members on subjects of professional interest. Speaking from the surveyor's standpoint, he would indicate a few, such as "the valuation of town or agricultural property," "rights of light," "town improvements," "valuation of manufacturing premises for rating and other purposes," "drainage and sanitary work," &c. He instanced the valuation of property in Sheffield after the inundation in 1864, as showing that at any time the young surveyor should be ready for emergencies. Such often arose in actual work, and the best preparation for a successful career was the accumulation in early practice of knowledge and experience for the hour of need. On the motion of Mr. C. J. Innocent, seconded by Mr. C. Hadfield, a hearty vote of thanks was awarded to Mr. Fowler for his address.

Reopening services were held at Above Bar Congregational Church, Southampton, on Wednesday week, after reconstruction at a cost of £5,000. The street façade is Gothic in style, and is of buff bricks with Leicestershire stone dressings. Mr. T. H. Kingerlee, of Oxford, was the builder.

The Chepstow local board elected, on Monday, Mr. Atkins, of Newport, Mon., as surveyor and inspector of nuisances, in succession to Mr. Richard Thorn, resigned. There were 67 candidates for the combined offices, the salary attached to which is only £100 a year.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Received.—G. A. W. and Son.—J. W. and R.—J. K. and Co.—L. B. and S. C. Ry. Co.

"BUILDING NEWS" DESIGNING CLUB.

E. P. Hinde. (There is no limit to age or sex. Read the Rules published in the Building News for Oct. 25th last.)—A. C. Breden. (It is usually impossible to satisfy unsuccessful competitors, and you are the first person who has called in question our fairness. We must decline to discuss our award, which was made entirely on the merits of the work submitted, and without doubt or favour.)—Credo and Others. (Your letters are noted; but every drawing must have the name and address of the sender written on the back.)

Correspondence.

MARKING HEIGHTS OF ROOMS ON PLANS.

To the Editor of the Building News.

Sir,—A short time since there was a correspondence in your columns with regard to the necessity of providing some method of marking upon plans the height of rooms, in addition to their length and width. Might I suggest that this might easily be accomplished by adopting the following plan, which, however, I do not claim to be original—*i.e.*, let the height of room be in ordinary figures in brackets, and placed beneath those denoting the length and width. For instance, a room 18ft. long by 16ft. wide and having a height of 11ft. 6in., would be figured thus, $\frac{18\text{ft. by }16\text{ft.}}{(11\text{ft. }6\text{in.})}$.—I am, &c.,

Oct. 31. Amethyst.

At the meeting of the Maidstone rural sanitary authority at the town-hall on Thursday week, Mr. S. Stallard, assistant surveyor to Mr. Hooley, was elected to succeed that gentleman, who has been appointed county surveyor to the Notts County Council. The voting was—Stallard, 9; Walter (Tynemouth), 2; Unwin (Wincanton, Somerset), 1. The salary is £250.

The new Wesleyan Chapel at Hatfield, Herts, erected at a cost of £2,100, was opened on Wednesday week. It seats 300 persons, and has been built from designs by Mr. Elijah Hoole, of London.

Intercommunication.

QUESTIONS.

10139.]—**Ventilator to W.C.**—Can any of your ders tell me why a direct down-blow comes from a tilator top, which is run up by side of chimney-stack, h 12in. clear space between, on a 4in. ventilating pipe? . D. B.

10140.]—**Spire.**—In the issue of the BUILDING NEWS the 25th ult. I inserted the following question: Will kind reader inform me the correct method of drawing entasis to a spire? I wish to apply it to a broach re 62ft. high, and rising from a tower 19ft. square. I l previously tried Gwilt's "Encyclopædia," and on re 1005 of the edition for 1888 I discovered this: "The asis of the spire, and due diminution of the tower ough the former is usually held not to have existed, ne spires being formed of two and even three lines at 'erent angles) are desirable, both for appearance and ength. They are common features in Essex and ddlesex, and the absence of them may be noticed by one going from Essex into Suffolk, the round towers which county have the entasis—but not those of a later e." "A mathematical method of setting out the asis for a spire was furnished by Mr. Thomas Turner, Hampstead, to the *Builder* for 1848, through the late ofessor Cockerell, R.A." I have also noticed that a irch at Watford, one built within the last ten years, sesses an entasis to the spire. In fact, the architect told me so. In that town there has been recently cted a Wesleyan chapel, and I remember noticing that he setting out of the spire there was a bulge given to Having failed to obtain information *re* the method, to consult the *Builder* for 1848, as mentioned in wilt," I had resource to the Query column of this per, and in the next issue I am informed by "M." that re is no necessity for an entasis, and it only occurs ough a blunder. "M." also tells me that the stone uld only be from 9in. to 6in. thick, taking it for granted t I am seeking information for a stone spire, while lly it is a timber one covered by lead. I am very teful to "M." for his reply to my query, but I should pleased to learn more upon the subject before I decide ntasis or no entasis"; in any case, I should like to ow the correct method of delineating it. As "M." tes that I am not accustomed to spire work (which is tainly true), I shall be glad if some reader who has ess to the *Builder* for 1848 will refer to page 375, l. VI., and kindly give me the particulars for which I now writing. Would "M." please say if he would rise me to have an eaves gutter, or merely allow the d to form a drip?—J. E. S.

10141.]—**Alteration to Premises and Local ards.**—In preparing drawings, say, for altering a se internally, by rearranging same, or taking in ms from an adjoining tenement; or, again, by altering wing of a residence into a separate dwelling-house, t necessary to have plans passed by the local board or al sanitary authority of the district?—DOUBTFUL.

10142.]—**High Chimney-Shaft to Boilers.**—otice on page 585 of this journal that there has been cted at Rainham, Essex, a chimney-shaft 186ft. high, taining a flue 9ft. in diameter at the bottom, and 6ft. he top; and that the head is built entirely in cement. his a right way of building a flue—making it consider- y less at the top than bottom; and will not the cement liable to fly, should there be intense heat, as is fre- ntly the case, at the summit?—TEACHABLE.

10143.]—**R.I.B.A. Exams.**—What books would be best to study from for the exams. in (1) Sanitary nce, strength of materials, shoring, &c.; (2) Mate- ls, constructions, &c.; and are papers issued by any ntleman who has passed the exam. as test-papers? uld Mr. Middleton or "G. H. G." give me any informa- n?—Z.

10144.]—**Heating Studio.**—I heat my studio by an stove; but at times it gives off a very disagreeable ell, both from the oil and of burnt air. How could I vent this? I have tried various oils, but all with the ne results. Any advice will oblige.—OIL-STOVE.

10145.]—**Public Buildings.**—Will some experi- ced architect kindly say what is about the average price foot for cubing public buildings—say, municipal ces? Also what system of ventilation they would ommend for same?—W. W.

10146.]—**Veneer.**—My client wishes to have his room roughly veneered with mahogany, both walls and lings, forming panels with solid mouldings. Will the neer stick to the present painted plaster walls when aned down; and how would it be applied? The present ors are to be veneered, using, of course, solid mould- s. Could you refer me to any similar work already ne?—B. E. A.

REPLIES.

10116.]—**Copper Roofs.**—The reply to this question s not properly dispose of it. It is quite true that it is less to use copper for roof-covering for the purpose of ning the beautiful effect of its green oxide, if it be so d in London or any other town the air of which is oke-laden. Under these circumstances it rapidly turns ck, *vide* the expensive curved mansard roof of the esham Insurance Company in the Poultry, and the eple of St. Peter-upon-Cornhill, re-covered with copper t year by Messrs. Braby and Co. Used in the purer nosphere of the country, the beautiful green effect soon pears. I am informed, however, but with what truth lo not know, that if the green oxide appear first, either natural or artificial means, then it forms a protective ting, which remains uninjured by subsequent exposure the smoky air with which it may afterwards be attacked, d it remains green to the end. The warehouse roofs of West India Docks were copper-covered when originally ilt, which was at a time when their situation was, com- ratively, in the country. I do not know whether they ll retain their colour, or whether the copper is there w at all; but I remember their beautiful appearance, nich was observable from long distances around, as of ntle slopes of green-hanging gardens; and this many ars after their neighbourhood had been densely packed with houses, and the air as smoky as any other part of London. For the sake of encouraging some variety in the material and colour of our roofs, it is worth while to ascertain—firstly, whether the green oxide *can* be rapidly formed by the application of any chemical substance, without injury to the copper as a roof covering; and, secondly, whether, when so artificially formed, the oxide will retain its colour against the attacks of smoke? I am informed that ammonia would be a suitable chemical. Perhaps some of your readers would assist us with their knowledge? Copper being cheaper now than it has been, the present time affords a good opportunity to endeavour to assist in redeeming, here and there, the excessive ugliness which the general appearance of our London roofs affords. Colour would attract attention to the crowns of our houses, and improvement in form would surely follow.—A. H.

[10129.]—**Spire.**—In confirmation of "M.'s" reply of Nov. 1, I may say that entasis to spire may be observed to the ornate one at Square Congregational Chapel, Halifax. It is a spire 70 or more yards high, and by many observers is much admired, although by others it is considered peculiar. I understand its peculiarity is caused by having to curtail the intended height, when it was built some 30 years since, on account of the foundation or tower showing signs of strain.—TOLOP.

[10131.]—**Contractor's Liability.**—If the cottages sank on account of the weight of the new adjoining building, I do not see how the clause stated can be enforced against the contractor, as the cause of settling of cottages cannot be put down to damage done to adjoining buildings by reason of the carelessness or negligence of the contractor's workmen during the carrying out of work.—TOLOP.

[10134.]—**Billiard-room over Stable.**—To clear from billiard-room the strong smell of ammonia that rises from stable under, besides seeing that drainage is right, have the stable thoroughly ventilated, and the billiard-room too. Fixing some non-absorbent material as suggested, between or over joists, would be expensive, and if not thoroughly done, would only bottle up the nuisance to the injury of the horses below, and but mitigate the unhealthful atmosphere above.—TOLOP.

CHIPS.

The Lancashire county council received at their meeting yesterday (Thursday) the resignation of the office of surveyor of county bridges, bridge-master, and surveyor of main roads in Lonsdale Hundred from Mr. Paley.

The parish church of Thurusco was reopened on the 30th ult., after being closed for renovation. The whole of the body of the edifice has been entirely removed and rebuilt under the direction of Mr. E. Isle Hubbard, M.S.A., Rotherham. The church was built between the years 1066-1087, and is in the Early English style. The renovation was imperative, owing to the dilapidated condition of parts of the building, which had become dangerous.

The Walker Engineering Laboratories, just added to the University College at Liverpool at a cost of £20,000, borne by Sir A. B. Walker, were opened on Saturday. Mr. A. Waterhouse, R.A., was the architect.

A new organ in the parish church of Winscombe, Somerset, was opened on Sunday. It has cost £410, and was built by Mr. W. G. Vowles, of Bristol.

At the last meeting of the Mersey Docks and Harbour Board the Works Committee submitted a recommendation that a shed 125ft. wide should be erected along the south quay of the Hornby Dock, at an estimated cost of £39,000, and that the quay adjoining the shed should be paved at a cost of about £5,600. In accordance with standing orders the confirmation of the proceedings was postponed. It was decided to provide slaughter-houses and meat stores in connection with the Woodside Animals Wharf, at an estimated cost of £8,500.

New Salvation Army barracks in Newhall-street, Hanley, were opened last week. The chief room on the ground floor is seated for 400 persons, and that on the floor above for 600. Messrs. R. Dain and Son, of Hanley, were the architects, and Mr. Thomas Chatfield was the contractor.

A special meeting of the York Corporation was held on the 31st ult. for the purpose of electing a successor to Mr. E. G. Mawbey, city surveyor, who was recently appointed borough surveyor of Leicester. The Lord Mayor moved the appointment of Mr. Alfred Creer, borough surveyor of Lancaster, and formerly deputy surveyor of Halifax, whom a committee had selected out of 87 candidates for the position, and after discussion the motion was unanimously passed. Mr. Creer gave a verbal promise that he would not relinquish the office for at least three years. The salary attached to it is £400 per annum, and private practice is not allowed.

A chapel attached to St. John's (R.C.) Institution, Boston Spa, was dedicated on Wednesday week. It is Perpendicular in style, is connected with the institution by a corridor, and cost £2,000. The architects were Messrs. M. E. Hadfield and Son, of Sheffield.

By a fire which occurred on Sunday on the premises of Messrs. Henry Birkby and Sons, contractors, of Wyke, near Bradford, damage to the extent of £3,000 was done.

LEGAL INTELLIGENCE.

HIGSON v. SHAW.—This action was brought by Messrs. Thos. Higson and Sons, builders, Blackburn, against Messrs. Henry Shaw and Co., brewers, Blackburn, to recover £1,558 4s. 5d., the balance of their account in connection with the erection of Jubilee Mill, Gate-street, Blackburn, built by Messrs. Higson and Sons, for the defendants. The defence was that by the contract the work was to have been completed by the 25th July, 1887, and in default the plaintiffs were to pay £10 per week penalty for every week the work remained incomplete; and defendants alleged that the work was not completed until July, 1888; further, they said that the plaintiffs had sent in a bill in October, 1888, for £1,331 4s. 7d. The defendants deducted 49 weeks' penalty at £10 per week from the £1,331 4s. 7d., and paid into court £341. The plaintiffs replied that the account for £1,331 4s. 7d. was sent in on the faith of a promise that if they reduced their claim to that sum it would be paid in full, and the plaintiffs, to avoid litigation, were willing to accept the £1,331 4s. 7d. in settlement; but the defendants refused to carry out the promise, and therefore, the plaintiffs claimed the full amount of their account; and as to the delays, they alleged that they arose from causes not under their control, and that, therefore, by the contract, they were relieved from responsibility. The action was part heard at the Liverpool Assizes in March last before Mr. Commissioner Vaughan Williams and a special jury, and he made an order referring it to the President for the time being of the Manchester Society of Architects, Mr. W. A. Royle. The arbitrator sat at the Old Bull Hotel, Blackburn, for twelve days, afterwards in Manchester and Liverpool for two days, and subsequently in Blackburn for two other days, and has now made his award. He finds that £600 is due to Messrs. Higson and Sons after giving credit for the £841 paid into court, and that £180 is due to the defendants in respect of the counter-claim.

METROPOLITAN BUILDING ACTS AND THE HEIGHT OF BUILDINGS.—Messrs. Lucas Brothers, contractors, of Great George-street, Westminster, appeared to a summons before Mr. Biron on the 31st ult., at the instance of Mr. Benjamin Tabberer, deputy district surveyor, charging them under the Building Acts with erecting Queen Anne's Mansions of a greater height than 100ft. without having obtained the special sanction of the London County Council. It was stated that this was the first case which had been pressed to a decision with regard to the height of buildings in the Metropolis, and Mr. Burton contended that the 18th and 19th Vic. cap. 122, sec. 12, part 1 of the schedule annexed to the same Act, and also sec. 3 of the miscellaneous provisions of that statute, pointed to the fact that the sanction of the Metropolitan Board (whose powers had been taken over by the County Council) was required for the erection of the external walls of a building to a greater height than 100ft.—Mr. Boyle urged that the statute made no such restriction. As long as they made the walls of the requisite thickness the height was immaterial.—Mr. Biron said the Act pointed to 100ft. as being a height not likely to be exceeded, but it went no further than that.—Mr. Burton: If you are against me, sir, and I take it you are, a building can be put up any height the builder likes. I must ask you for a case, for this is a very important public question.—Mr. Biron: No doubt. I suppose you can agree as to the facts. The building is higher than 100ft.?—Mr. Boyle: We admit that.—Mr. Burton: And we admit that, so far as the thickness of the walls, the building has been constructed in accordance with the Act.—Mr. Biron: And in my judgment they are not restricted to 100ft. I hardly see how I can grant a case.—Mr. Boyle: Let them appeal in the ordinary way. So generally is it known that the Council have not the power they claim that a Bill was brought into Parliament to regulate the height of buildings.—Mr. Biron said if there was going to be an appeal it had better be by a case.—Mr. Boyle did not suppose the London County Council would go on, as they must know they were wrong in law. He asked for costs.—Mr. Biron dismissed the summons, and allowed five guineas costs.

SAUL v. CARTER, JOHNSON, AND GREAVES.—His Honour, Judge Bedwell, has delivered judgment in this case, which has been before the County-court at Pontefract on four occasions. The plaintiff, Mr. Sylvester Saul, farmer, Knottingley, sued the defendants, Mr. George William Carter, Dr. Thomas Johnson, and Mr. J. H. Greaves, architect, of Pontefract, for £5, damages for breach of agreement in connection with the making of a road. In 1882 the plaintiff, Mr. Carter, and Dr. Johnson purchased certain lots of property at Knottingley under an order of the Court of Chancery. The property was sold in twelve lots, subject to the making of a road in accordance with a plan attached to the particulars of sale, made by Mr. Bowman, of Snaith. In 1888 Mr. Greaves was instructed by Messrs. Saul, Carter, and Johnson to make the road referred to in conditions of sale. Mr. Greaves, however, declared the sale plan absolutely and utterly misleading, and he planned the road in as near a

position as that shown on the plan made it possible under the circumstances. Mr. Saul objected to the road as proposed by Mr. Greaves. Mr. H. B. Thorpe, architect, of Goole, produced plans and gave evidence for plaintiff, and Mr. Paterson, M.I.C.E., gave evidence for defendant. His Honour said, in giving judgment, there was not the slightest pretence for the plaintiff's objections to the road proposed by Mr. Greaves. He (the Judge) had viewed the property, and he would not deviate one inch in the making of the road from the position Mr. Greaves had taken. He therefore non-suited plaintiff as against Mr. Greaves, and he gave a verdict for Mr. Carter and Dr. Johnson with costs on the higher scale.

Frontage Lines and the Building Acts.—At West London Police-court, on Tuesday, Frederick Winfield, a builder, was summoned, at the instance of the Fulham Vestry, for building beyond the line of frontage in Crown-road and Adeney-road. It was stated that a letter was sent to defendant cautioning him not to proceed until the plans had been approved. Mr. Cautley said the defendant was willing to do everything that was required short of pulling down the houses. Mr. Norrington, the vestry surveyor, stated that Crown-road was not straight. Defendant said until he built up to the first floor he did not know that he was doing anything contrary to law. He did not remember receiving a letter cautioning him not to proceed with the buildings until the plans were approved. Mr. Plowden held that the houses in Crown-road had been built beyond the line of frontage, and therefore he made an order for their demolition to the extent necessary. With regard to the corner house, he should not make any order, as he was guided by the decision in the (De Vere Gardens) case of Barlow against the Kensington Vestry, as it was partly in two streets. With regard to the house which was wholly in Adeney-street he made an order for its demolition to the extent necessary.

WATER SUPPLY AND SANITARY MATTERS.

Ardrossan New Waterworks.—The opening ceremony of the new Mill Glen Reservoir, constructed to the order of the Burgh Commissioners, took place on Monday. Mill Glen lies at a height of 200ft. Ordnance Survey on the old parish road to Dalry. The ground within the commissioners' fence is 17¾ acres. The finished level of the embankment is 46ft., while the sluice-shaft is 54ft. high. This new reservoir, when full, will cover 8 acres of land, affording storage capacity for 20 million gallons of water. Mr. Reid, of Messrs. Leslie and Reid, Edinburgh, is the engineer.

CHIPS.

At a meeting of the executive of the Scottish Society for the Registration of Plumbers, held on Friday, it was resolved to continue, both in Glasgow and Edinburgh, during the winter months, the public discussions upon plumbing, carried out last year. The number of craftsmen who have passed the necessary qualifying examination and enrolled themselves has, it is reported, been largely increased since last year.

Mr. J. A. Sargeant, who for nine years has been surveyor to the West Cowes local board, and also inspector of nuisances, died on Tuesday week. During the time Mr. Sargeant has been town surveyor many important works have been carried out by him, and the area of Cowes has been greatly increased.

The Berwick Board of Guardians have adopted a report by a committee which recommends the erection of a new workhouse at a cost of £11,000.

Messrs. Meek and Son, civil engineers, Edinburgh, have completed their survey of the proposed Forfar and Brechin Railway, and their plans have been prepared. A meeting of the committee appointed in July last was held in Forfar on Monday, at which a draft of the Parliamentary notices was submitted and unanimously approved. The provisions of the draft of the Bill were also generally approved.

A stained-glass window, illustrating some of the chief events in the Life of the Saviour, has been placed at the east end of St. Jude's Church, Hull. The window, which has been presented to the church by Mr. Henry Moor, of Newland Park, Hull, in memory of members of his family, has been designed and executed by Messrs. Powell Brothers, of 30, Park-square, Leeds.

A window has just been placed in the little church of Rydal (the Rydal Chapel of Wordsworth) as a memorial to Dr. Arnold, of Rugby, and Mrs. Arnold, by their surviving children and grandchildren. The window is by Messrs. Burlison and Grylls, and consists of two lights. In one is represented the Confession of St. Thomas, and in the other the Appearance of the Risen Lord to His Disciples at the Sea of Galilee.

Our Office Table.

We regret to announce the death of Mr. William Millican, F.R.I.B.A., of Grey Friars, Leicester, in the 60th year of his age. Mr. Millican, who died at his residence, Upland House, Leicester, on Sunday, was for many years in partnership with Mr. Thomas Smith, of Leicester, the firm being known as Millican and Smith, and has carried out much work in Leicester and its neighbourhood. We illustrated a drug warehouse in Leicester, designed by Mr. Millican, in the Building News for July 25, 1879. He was a prominent member of the Leicester and Leicestershire Society of Architects, and had for the past eleven years been a Fellow of the R.I.B.A. He was lieut. col. of a local corps of volunteers, and a justice of the peace for the borough, in which he was highly esteemed.

The rules and syllabus have just been published of a series of special examinations for members in (i.) forestry, (ii.) sanitary work, and (iii.) land surveying and levelling, about to be instituted by the Surveyors' Institution. These special examinations will be wholly independent of those in the same subjects forming part of the ordinary examinations of the Institution, and will be held concurrently in the three classes in June of each year. Candidates must in each case be professional members of the Institution. Applications must be sent in not later than the 20th April preceding the examination, and the fee charged in each class is three guineas, and certificates of passing will be given to successful candidates. The examination will consist of written papers dealing with some or all the subjects comprised in the syllabus; to these be added in the forestry division a short essay on some important point of practice, and a *viva voce* examination to include the identification of specimens of various timbers, seeds, foliage, twigs, and manifestations of disease. The syllabus is very comprehensive, and includes physiology and anatomy, seeds, propagation, site aspect, climate and situation, soil, preparation of site, fencing, selection of trees, forest grasseries, planting, management, and forest tools, measurement and valuation, uses of timber by-products, and the legal aspect of the subject. In the examination in sanitary science there will be added to the written papers drawings, and should the examiners see fit, reports on selected examples of sound and defective sanitary arrangements with oral explanations. The syllabus deals with the sanitary arrangement of buildings under seven subdivisions—surface water and rain-water disposal, water supply, remodelling drainage systems, farm drainage, main drains for building estates, disposal of sewage and refuse, and the law relating to sanitation. The examination in levelling and surveying follows generally the course of instruction given in a series of articles in our columns just completed. In the list of books recommended to the candidates we are surprised to note that Louis Jackson's excellent textbook, "Aid to Surveying Practice," published by Crosby Lockwood and Son, is omitted.

According to the *Birmingham Post*, several of the comparatively modern churches in that city are in a dilapidated, and some in a positively dangerous, condition. In one case, that of St. Mark's Church, King Edward's-road, the city surveyor, Mr. W. S. Till, has served a notice on the authorities requiring them to pull down the spire of the church, and repair or secure other portions of the building, in conformity with the provisions of the Public Health Act. The notice states that the spire and portions of the tower are in a ruinous condition, and are dangerous to passengers or occupiers of neighbouring buildings. St. Mark's is one of several churches erected in Birmingham about 1841, and built of a very soft and fragile sandstone. The design was by Sir Gilbert Scott, and the stone was a gift from a quarry at Bromsgrove. For a considerable time it has been apparent that the spire has been in a very insecure condition, and lately, when a high wind has prevailed, showers of sand have blown from the spire and tower, while one of the buttresses to the tower has fallen away from the main structure, and instead of being a support, is a danger. The tower and spire rise to a height of about 90ft., and the latter, owing to the crumbling away of the stone, has leaned considerably in one direction. Mr. J. A. Chatwin has been instructed to report on the state of the whole building, and the work of demolishing the spire has been commenced. Little more than 45 years ago four churches—St. Luke's, Bristol-street; St. Stephen's, Newtown-row; St. Andrew's, Bordesley; and St. Mark's—were built in Birmingham of stone from the same quarry, and to-day they are mouldering fast in a common decay, although large sums have been in the other three cases spent in repairs and renovations.

An inlaid monumental brass is about to be let into the floor of the abbey church of Dunfermline over the vault in which was buried in June, 1329, King Robert the Bruce. The design is by Mr. W. S. Black, Queen-street, Edinburgh. The style of work belongs to the beginning of the 13th century, and in character resembles the memorial to the Saxon Etheldred in Wimborne Minster, and that to the Royal Duchess of Gloucester in Westminster Abbey. The figure of the king is life-size; over his suit of chain-mail armour he wears his kingly robes; his hands are folded in an attitude of prayer, and his feet rest on a recumbent lion. His great two-handed sword lies by his side. The brass is let into a slab, 9ft. by 4ft., of old Egyptian porphyry—presented by the Earl of Elgin—which has been cut from an ancient sarcophagus brought to this country by the grandfather of the present earl. The cutting, polishing, and preparing this material has been done by Messrs. Stewart M'Glashen and Son, Canonmills Bridge.

MEETINGS FOR THE ENSUING WEEK.

Monday.—Surveyors' Institution. Address by the President, E. P. Squarey. 8 p.m.
Bradford Historical Society. "Our Excursions," by G. Hepworth.

Tuesday.—Society of Architects. Opening address by the President, Robert Walker, of Cork. St. James's Hall, Piccadilly. 7.30 p.m.
University College, Gower-street. Free Lecture on "Applied Art," No. 5, by H. Stannus. 5 p.m.
Sanitary Institute, "Sanitary Law," by A. Wynter Blyth. 8 p.m.
Institution of Civil Engineers. Inaugural Address by Sir John Coode, K.C.M.G. 8 p.m.

Thursday.—Royal Academy. "Painting," No. 1, by Prof. A. H. Church, F.R.S. 4 p.m.

Friday.—Architectural Association. "The Paris Exhibition," by Banister F. Fletcher. 7.30 p.m.
Institution of Civil Engineers. "New Harbour at Boulogne," by S. C. Bailey. 7.30 p.m.
Sanitary Institute. "Sanitary Laws Affecting the Metropolis," by A. Wynter Blyth. 8 p.m.

Architectural Association, 9, Conduit-street, W.—November 15th. Paper by Banister F. Fletcher, Esq., on "The Paris Exhibition." A large number of illustrations will be shown.
Fred. R. Farrow } Hon. Secs.
Ernest S. Gale }

The bicentenary of the landing of William Prince of Orange on British soil was commemorated on Tuesday, when a statue of the Prince was unveiled at Brixham, on the shores of Torbay, where he first set foot on English ground. The execution of this statue has been intrusted to Messrs. W. and T. Wills, of London. The base on which the figure stands is of grey Cornish granite, and comprises two steps, surmounted by a Classic moulded pedestal 10ft. in height. The statue itself is 8ft. high, carved out of a block of Sicilian marble of a light grey colour, and weighing over two tons. The right foot is raised upon a piece of rock; the body is drawn full up with expanded chest. In his right hand he grasps his plumed hat, and his left hand is on his breast. The cost of the statue was £800.

An altar, dedicated to St. Benedict, has just been placed in the Roman Catholic Church, Parbold, Southport. The lower portion up to line of retable is of coloured alabaster, relieved with carved panels in white alabaster and low-relief ornament, picked out with gold. The tabernacle, with fine repoussé work front, has also a carved framework of coloured alabaster. The pedestal supporting the five figures—St. Benedict, St. Gregory, St. Augustine, St. Placidus, and St. Scolastica—has also pedestal of same material. Surmounting the whole are very richly-carved canopies, with carved pinnacles, &c., in Caen stone, relieved with alabaster inlay, and supported by shafts of Cork red marble. The retable and columns supporting altar-table are also of the latter material. The whole is the production of Mr. John Roddis, Birmingham.

The memorial-stone of new police premises for the northern district of Glasgow was laid in Maitland-street on Friday. The building will cost £12,000, and the chief contract—that for masonry—has been taken by Mr. Peter McKissock.

PROPOSED NEW MARKET.

SELECTED DESIGN

BOROUGH OF SWANSEA.

J. Buckley Wilson, F.R.I.B.A.
Glendinning, Moxham, M.S.A.
Architects, Swansea.





KENILWORTH CASTLE, EXTERIOR OF GREAT HALL.



HOLY TRINITY CHURCH, STRATFORD ON AVON.

P E MASEY, ARCHT DELT

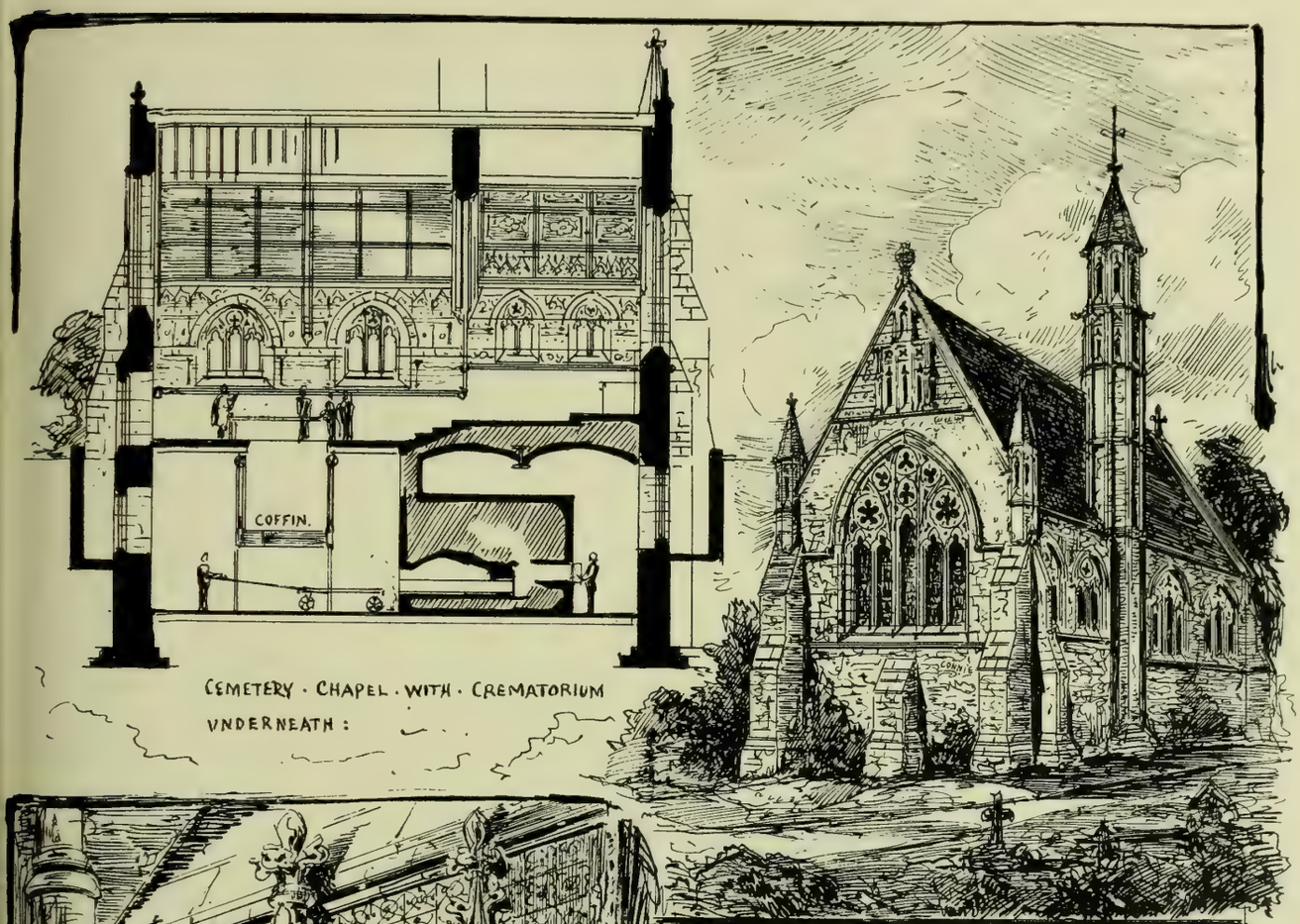


CHANCEL, HOLY TRINITY CHURCH, STRATFORD ON AVON.

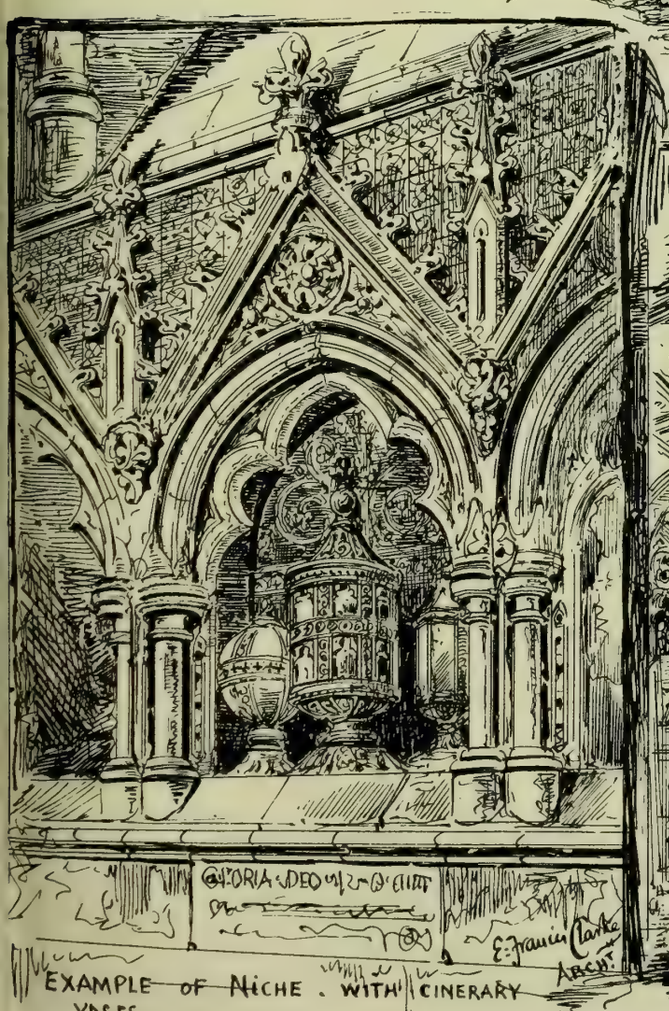


APPROACH TO WARWICK CASTLE

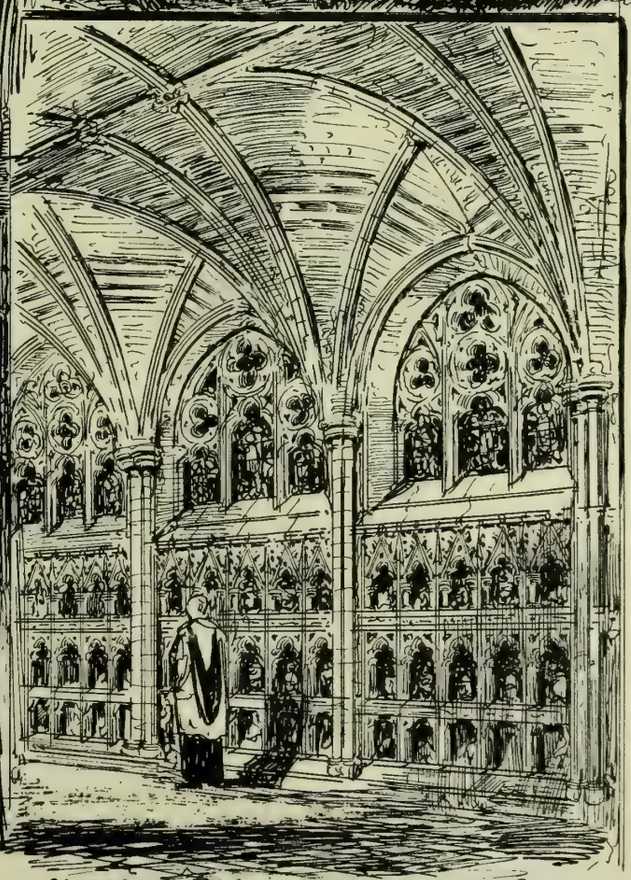
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CEMETERY · CHAPEL · WITH · CREMATORIUM
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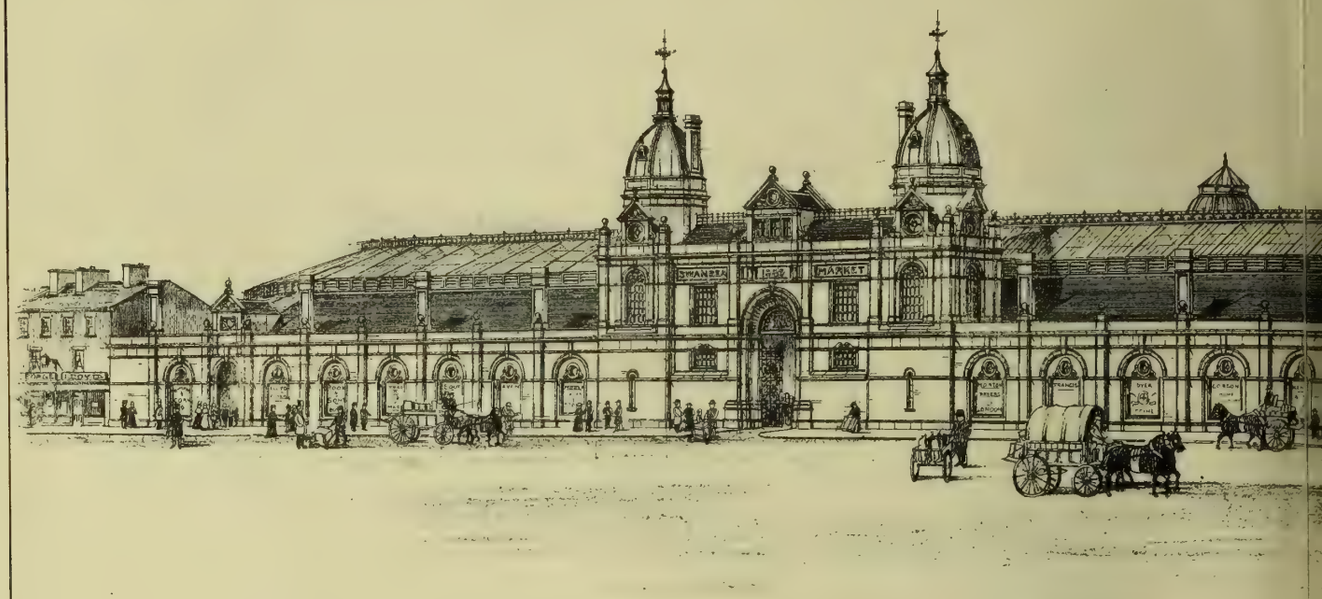
EXAMPLE OF NICHE WITH CINERARY VASES.



COLUMBARIA IN AN AISLE OR CLOISTER.

Photo Lithographed & Printed by James Akerman, 6, Queen Square W.C.

CREMATION · FROM · AN · ARCHITECT'S · POINT · OF · VIEW ·

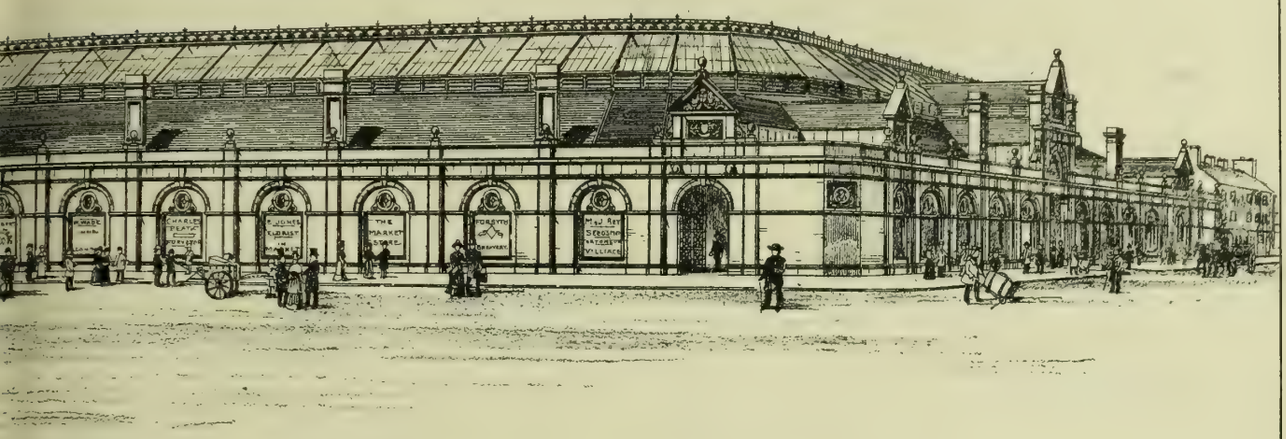


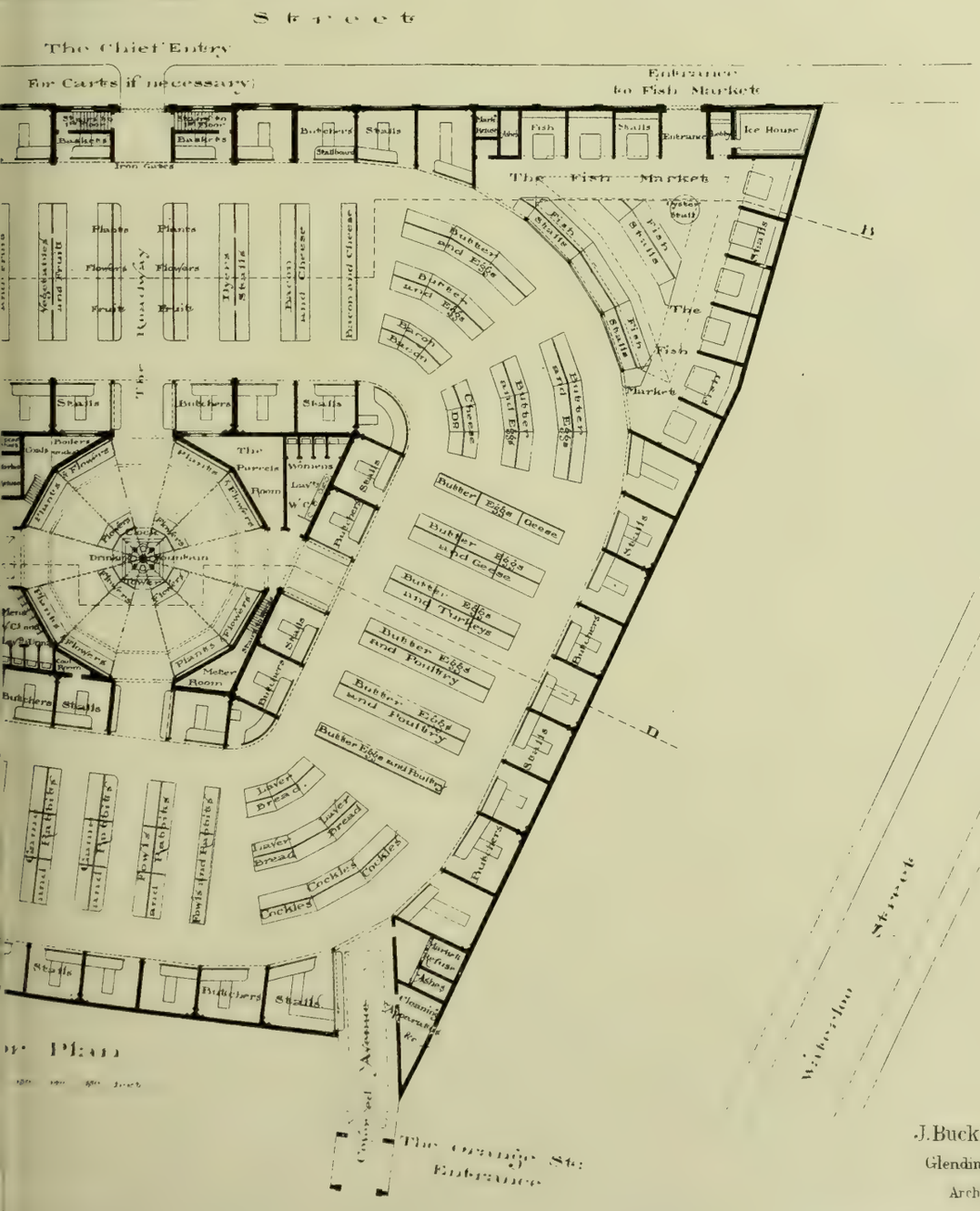
Oxford



The General or Ground

SELECTED DESIGN FOR PROPOSED NEW MARKET. BOROUGH OF SWANSEA





J. Buckley Wilson, F.R.I.B.A.
Glendinning, Moxham, M.S.A.
Architects, Swansea

Plans Lithographed & Printed by James Akerma, 6 Queen Square W.C.


J. Longham del.

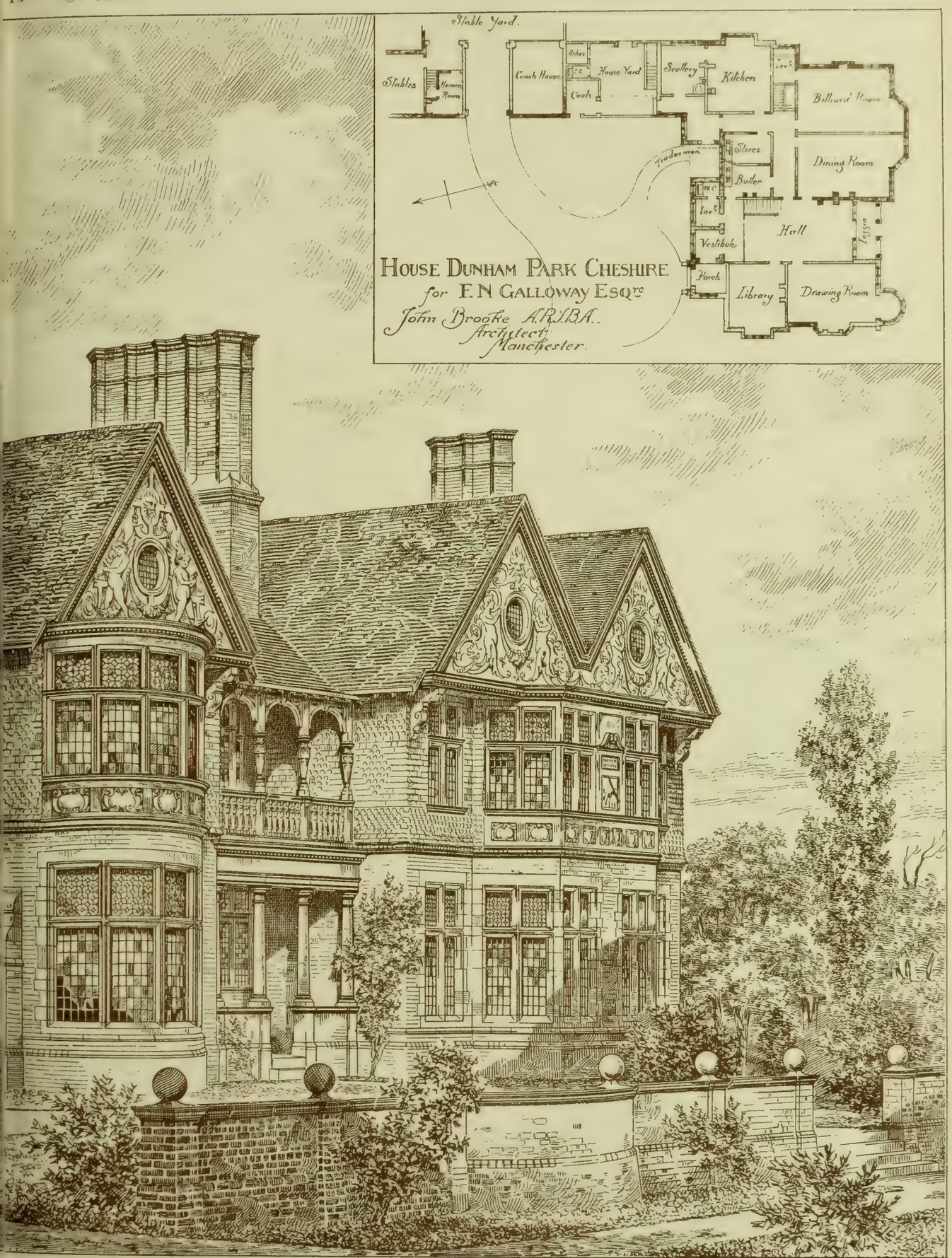


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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1819.
FRIDAY, NOVEMBER 15, 1889.

PUBLIC BUILDINGS AND THEIR DECORATION.

AMONGST the subjects discussed at the architectural section of the National Art Congress, held at Edinburgh, was the very prominent one of the municipal control over the erection of buildings designed for public use, and the extent to which architecture and decoration are considered in their design. Public buildings are more or less the outgrowth of necessity and practical requirements, in England at least, and accordingly their inception and design are based on strictly utilitarian motives. The keynote of the question relating to municipal legislation as it affects architecture was sounded by Sir James Gowans, Lord Dean of Guild of Edinburgh, when he said, "while the most trivial petition to sanction a plan was in most cases presented by a procurator, the plan may be the production of any person who has had no training to qualify him as an architect." Paraphrased, it means there is far more officialism than architecture in the matter. It is the same in Edinburgh as in London, the Courts of the Deans of Guild have neither by common law nor statute any control on questions concerning architectural treatment or the material to be employed, their functions being limited to fixing lines and boundaries, and to questions of stability and sanitation. In London, the bodies in whom are vested the powers of the Legislature in respect to building are in the same helpless condition: they can only lay down frontages, but have no voice in controlling the architectural treatment, or the mode of building. But it is the machinery that is mainly in fault. If any design comes before a corporation or an urban authority, it is submitted to the surveyor or architect in an official manner, who brings it before a committee, and they too often pass a design as they would sign a cheque. If any question of design should arise, which is very seldom likely to occur, the committee collectively have a voice in the matter, or the council come to a decision by taking a division on the question, the voting going according to the favour or otherwise with which the architect's design is entertained, too frequently the *pros* and *cons.* being taken as an indication of party feeling. The real question of merit is entirely put out of sight by the contending factions. It is the party shibboleth which is the main thing, to which all else is sacrificed. Well may Sir James Gowans say English jurisdiction in these questions is a "clumsy and impracticable way of disposing of such business." He proposed to confer on the Dean of Guild Courts a negative power; or, in other words, that the Courts should decide whether any building or design was in itself, or in relation to other buildings, objectionable, an appeal court being established for questions of taste, composed of professors of art and architecture at the university. If we turn for a moment to consider in what manner designs for municipal buildings, as libraries, museums, and public schools are selected, we shall find an organisation of individuals doing the work who have been elected with the least qualification for such a purpose. Take an ordinary town corporation, the aldermen and burgesses of which have no higher qualification than that they possess property or are rated to the poor rate at not less than a certain sum. Then we have our local boards, or urban authorities, composed of members having a property qualification of the same amount as in the former case, one-third of their number retiring every year. The rural authorities are constituted in much the same manner, the guardians acting in this capacity, who are elected yearly, and must have a certain rating qualification. Our school boards have no prescribed qualification. Thus, municipal bodies, urban and rural authorities, and school boards are the judges of our public buildings. They, at least, have the power to select or veto, although they are, as a rule, quite incompetent to perform the critical duties required of them in these matters. The sub-committee is often composed of a few of the more competent men—perhaps a builder, an estate agent, or an undertaker—and to them is intrusted the duty of examining designs and plans of municipal buildings, museums, technical and other schools, and of reporting on them with the aid of their surveyor, or of examining, approving, or rejecting plans of new premises within their jurisdiction under the Public Health Acts and their by-laws. We all know how these duties are performed. Though, with the help of assessors and local officers, glaring inconsistencies are prevented, these local bodies have certain powers which enable them to set on one side the recommendations of those called in to advise them, as in many recent competitions have been the case. So long as architects and their work are amenable to those who know nothing of their art, who are devoid of taste and the faculties of judging between good and bad architecture, it is of little use to raise the standard of taste of those who compete for public buildings. The only way of preventing the abuse is for the profession to combine together and decide for themselves upon what terms they are willing to send in designs, and so compel authorities to guarantee that their designs are submitted to a competent tribunal in which architects are largely represented. No other terms than these will ever insure the selection of designs worthy of a great municipality; no other terms would be accepted by the legal or medical professions in questions involving knowledge of law or medicine. No benefit will result from making architects who send in designs for public bodies more competent, if the bodies themselves, incapable of passing a right judgment, are allowed to have the full control of the architect's labours. The public representatives should themselves be first educated in their obligations to a profession like that of architecture, and this can only be done by architects themselves agreeing that they will not send in designs to those who cannot understand them. A court of architects presided over by men capable of taking into consideration the various points of good design, conformity to legislative enactments, surroundings, and matters of taste, ought to be one of the conditions of all public competitions, as well as all submissions of designs for buildings in the Metropolis. Frontage lines, boundaries, sanitation, lighting, height of new structures, style of building, are among the questions that would be submitted to a tribunal of this kind. In London our public edifices have been erected in utter disregard of everything save the Building Act; they have been built on sites without the slightest reference to projected improvements of thoroughfare and surrounding buildings. The sites themselves have in many cases been those which necessity rather than choice has dictated, which have been purchased when old premises have been removed at prices which have been thought commercially desirable and remunerative.

As to the artistic and decorative character of our public buildings, a good deal has been written from the artist's point of view. At one time the sculptor has protested against the parsimonious manner in which his particular art has been treated or left out in the cold, regardless of all that the history of architecture has revealed. Figure sculpture which in the hands of Greek, Roman, and Mediæval artists had always a distinct relation to architecture, and to which it became an accompaniment, was now denied a place in buildings of a monumental character. Instead of being allied to architecture, it was now thought to be subsidiary if not unnecessary, and architects have been accused of not aiding the sculptor. No less the decorative painter and frescoist have inveighed bitterly about the bald and colourless architecture of our interiors. The nude beauty of architecture is of the most abstract kind, and it is asserted with truth that colour is wanting to make it complete and in touch with the harmony of nature. As Nature without colour is inconceivable, so it is argued art without colour is incomplete. The apologists for colour point to the wall-paintings in the Sistine Chapel and Stanze the mosaics on the walls and cupolas of Constantinople and Ravenna. The polychromist, mosaicist, and ceramist each in his way deplores the bare walls of our church interiors, and shows what may be done to restore to them life and instruction. Each of these artists has to bring the public mind into consonance with his ideas, and the architect to look upon a building as a receptacle for painting or mosaic. How came the estrangement? As the arts developed a spirit of independence appears to have taken possession of their professors. As one authority says, unity was impaired by self-assertion. Thus the sculptor no longer cares to work in concert with the architect; he has far better patrons among the wealthier classes, who can afford to pay for statues and busts; the painter, too, finds easel pictures pay far better than wall painting or frescoes. He has confined his attention to landscape, portraiture, and genre, and pictorial composition. At one period he devoted his noblest efforts to the altar-piece or the fresco in the church of his native city; now he finds the most lucrative practice in commissions and in picture galleries. Independence has been one cause of the schism between architecture and the allied arts. The history of mural decoration, in part, is the history of the dissensions which have taken place between the artist and the architect. The Greek and Pompeian painted their wall subjects in strict subservience to the architectural design. Michael Angelo on the other hand, composed his pictures in a free manner; he was not restrained by architectural obligations in the Sistine Chapel. The earlier artists worked in harmony with the structure—they applied an architectural treatment. Afterwards, as the arts developed, they became less dependent on the structure, and at length the arts asumed an isolated position. This separation between the arts has been growing ever since, and is the chief reason why our public buildings are now left colourless and lifeless, or consigned to the hands of decorators. Mr. W. Hole and Mr. Roscoe Mullins, who read papers the other day on the decoration of our buildings, appealed for a more complete embodiment of local art; but we are afraid that we shall not realise the united effort of our painters, sculptors, and architects till those classes are again joined or work together with more unanimity and good feeling. The sculptor and painter must each give up a little of his individuality; the architect impose fewer obligations of a structural character, in other words, give up a little of his architectural ornamentation and provide opportunities for the sculptor and painter. There must be less self-assertion, and each must give something up before it becomes possible to make our municipal edifices, our schools and libraries, and our museums replete with incidents of national life or local history. In the same manner

churches might be made far more real instructors and interpreters of Gospel story and ecclesiastical history to the masses of those amongst whom they are reared, if some portions of the blank plaster walls between arcade and clerestory or the walls of chancel were covered with sacred imagery in fresco or mosaic.

CORNERS AND CENTRES OF BUILDINGS.

IN our London street architecture the varieties of corner treatment may be summed up under two general types—the plain angle, and the circular or canted corner; under the latter being comprised the circular or polygonal cupola or turret termination, so characteristic of the street architecture of the United States. Mr. Frank T. Baggallay, in his interesting paper read at the Association on "The Treatment of Angles," mentioned a few of the difficulties which the architect had to meet in managing angles and angle columns, and the student's attention was well drawn to the subject. It is one of the weak points in design by juniors, who seem to think that if the elevations of two adjacent fronts look satisfactory, there can be little trouble about the angle. They do not think that the horizontal façade lines may not all meet, and that the appearance of the angle, when seen in perspective, is an item in the effect. Architects seldom trouble about their building angles, because their attention is confined solely to the façades, and in this way we find grand sites and opportunities lost, and the building spoilt by an ill-studied arrangement of the features at the angle, especially the roofing. We are speaking now of corner sites, in which considerable architectural effect can be obtained by accentuating the corner. In plain buildings in streets that do not return there are two very objectionable modes of angle treatment. The first is to stop the features such as cornices and stringcourses abruptly, or to cut them off square at the end, the two ends of the building being made plain sections. Nothing can look worse and more unfinished—as if the design had been made by the yard lineal, and the ends had been cut off to suit the frontage. The effect is more apparent and objectionable when the building rises above the adjoining premises, thereby exposing to view the abrupt sections of the cornice and other members. The second fault is to return the cornice and members without emphasising or solidifying the angle by piers or pilasters. Both of these plans are to be avoided. Of the simpler methods of dealing with plain angles, one is to leave them quite bare, and return or mitre the members upon themselves before reaching the angle. We have a few examples of this treatment. It is, at least, a dignified way of terminating the cornice, and is far better than running it against a block or truss, as is often done by builders. The stopped ends are never satisfactory, unless the corner is brought out boldly and emphasised.

To take one notable example of a façade in which a columnar ordinance is used, we may refer to the Strand front of Somerset House; the engaged columns along the façade are here continued to within about three-quarters of a diameter from the angle; the cornice, being higher than the adjoining buildings, is returned round the ends. This plain piece of wall at the end enables a small break or internal angle to be made in the cornice and balustrade at the outer angle, as the entablature is returned before it reaches the end. Still, for all this, there is a rather abrupt-looking termination to the façade, as viewed a little within the front, and which a wider plain face on the outside of the last column would have rectified. The angle pilaster of the Classic-treated building is more satisfying and agreeable to our sense of fitness than the round column at the end of a façade, and the temple *in antis* supplies us with the proper architectural mode of stopping a columnar front. This can be strengthened by adding to the anta a second inner face of half the diameter of the corner. In large buildings the piers look better placed on each front a little removed from the angle, that is, allowing the angle of the fronts to appear, breaking round it the entablature and members. Sometimes variety is obtained by rounding off this angle between the pilasters. More stability and architectural dignity are obtained by the first-mentioned plan than by making a single square pilaster at the angle. The rustic quoin is quite a modern expedient. The Italians used it with good effect in their palaces, as in the Farnese and Pandolfini: in the former it is rather cramped near the windows. The effect of quoins in dwarfing a building is evident, and Mr. Baggallay's suggestion not to make them too marked or to project them beyond the wall face may be usefully borne in mind. No doubt the quoin was a development of the long-and-short work of the Saxons; at any rate, it was an improved form of angle treatment which could be applied to stone as well as brick buildings, and took the place of the angle pilaster. The wide piers at the ends of a façade are a reasonable and effective way of marking the angle, and these can be broken up into panels or pilasters. These corner piers are better set a little within from the real angle, as in the case of pilasters, and their design requires some careful consideration to avoid heaviness. For niches and sculpturesque accessories, the solid square angle piers can be made very appropriate, and the French architects have set us some very noble examples of this sort of design, in which the square piers are brought boldly out, and made decorative adjuncts to the façades.

There is another form of corner which has of late acquired popularity. We mean the corner turret, or circular corner. Numerous examples of the circular corner to buildings with two fronts will occur; but few of them are satisfactory. Mr. Waterhouse's corner tower to the National Liberal Club at the corner of Northumberland-avenue is one of the most successful instances; but the reason it is so ought to be made clear. To our minds, the corner tower is here a good feature; first, because it terminates an acute-angled site; secondly, because it was the only satisfactory mode of dealing with the roofing; thirdly, because it was a feature towards the Embankment. The two first of these reasons are wanting in the case of a square street building at the corner of two streets. There is no *raison d'être* why one corner should be expressed more than another in a square-planned building; the only motive is that the corner as it is seen on both sides may be emphasised as a terminal feature. In Renaissance buildings this corner treatment has received some attention, though it has generally been in connection with other cupolas or terminal features of a similar kind. Generally the corner turret has agreed better with structures in the Gothic style, where the motive for balance is less evident; in Renaissance designs the single corner feature is apt to destroy the unity of the composition, and for this reason it has been a rather difficult object to treat. The rounded or canted corner is, nevertheless, a desirable mode of dealing with buildings of this class, and the problem is worth the attention of the architect. We cannot say the American architect has successfully met the difficulty: the attenuated cupolas we sometimes see are anything but pleasing features. The inverted curve forming a quadrant has the advantage of making the angles more decided; and in all cases of circular corners they should be made to start from a square set-off on each side, so that each façade should termina with a visible angle. If sufficient widt can be given to the canted or round corne the ends of each side façade can be made terminate by a square pier or turret betwee which the corner would appear as a di tinctly-treated part of the design. Such disposition would materially lessen the ol jection to the usual forms of corners in ou streets, to get over the difficulty of havin to carry up a cupola or turret.

The mode of treating the centres of façad is equally important, and ought to be take into consideration. A long, evenly divide front, with windows and piers equally di tributed from end to end, is the most intrac able form for corner emphasis. The ang quoins, pilasters, or piers next windov look weak, as the idea of continuation strongly suggested to the eye by th equal distribution of the windows ar pilasters. When the angles have to b emphasised or made features of, it more agreeable to place the openings in th middle of the façade, leaving a wide space wall between the extreme ones and th angles. The extremities can then be broke by projections of piers or turrets, which wi then be found to agree with the compositio as a whole much better than they often do i designs in which they occur.

THE SYMBOLISM AND ICONOGRAPHY OF EARLY AND MEDIÆVAL CHRISTIAN ART.—VIII.

By GEORGE ASHDOWN AUDSLEY, F.R.I.B.A.

(Author of "Handbook of Christian Symbolism," and several works on Architecture and Art.)

ST. JOSEPH, the husband of the Virg Mary, is usually invested with th circular Nimbus, either with a perfectly pla or an ornamented field. There are some po traitures, however, of this saint, met with the stained glass of French churches, as in window in the east end of the cathedral Chartres, in which the Nimbus does n appear. In certain subjects in the Life the Virgin, notably in the Flight into Egyp St. Joseph is sometimes represented witho any special mark of holiness. An instan of the Nimbus accorded to him, of as early date as the tenth century, may be found the *Benedictional of St. Æthelwold*, in th possession of the Duke of Devonshire. In th miniature of the Nativity, St. Joseph appea invested with a plain circular Nimbu Didron tells us that in a *Chronicle* the eleventh century, preserved in th Royal Library, at Paris, there is a miniatu of St. Joseph being warned by an angel to tak the infant Saviour and the Virgin in Egypt; and here the saint has the Nimbu whilst in another miniature in the *Evangil de Saint-Martial*—a manuscript of th thirteenth century—representing the Flig into Egypt, St. Joseph has no Nimbu Didron considers this peculiar, seeing that, the same book, the three Magi, and eve King Herod, are invested with the attribut He remarks:—"It would appear that t Nimbus is in these cases an indication power rather than of holiness, and that t manuscript was executed under Byzanti rather than Latin influence." In the *Ben dictional of St. Æthelwold* the Magi a invested with crowns, but, correctly, have Nimbi.

It is somewhat difficult to realise the clai Joseph has to be distinguished as a sain and it is quite evident that the early artis only recognised the right in a timid manne as a simple reflection of the glory of h spouse, the Virgin Mary. In fact, it is n until the sixteenth century that we find h raised to the dignity of a saint in his ow right. Notwithstanding this, we find t Nimbus given to Joseph, very general all through the Middle Ages, both in pa traitures and histories. In the "Marriage



Fig. 26.

e Virgin," Fra Angelico has given both ary and Joseph the circular Nimbus. In the oup already illustrated (Fig. 25), St. Joseph invested with a Nimbus in all essentials nilar to that given to the Virgin. He rries the lily, expressing the purity of his lations with the Virgin; an idea the Middle ge and later artists always strove to convey. ıe lily must also be recognised as an emblem the Virgin Mary.

Next in importance to the Virgin come the our Evangelists. In all except late works art we find both their portraitures and mbols invested with circular Nimbi. These not differ in any essential points from the imbus of the Virgin Mary, whilst some- nes they are treated in a similar manner to e Nimbi of angels, as already described. the Evangelists are almost invariably ntified by their symbols, books of their spels, or scrolls bearing legends, artists ve seldom thought it necessary to inscribe eir Nimbi with their names, as in the case lesser personages or of those less easily entified: and as their symbols—the Winged an, the Eagle, the Ox, and the Lion—are marked in their character, and have ways been so well known, it was also con- lered unnecessary to inscribe their Nimbi. ıe fine series of the symbols of the Evan- lists which adorns the magnificent thir- enth-century bronze font, in the Cathedral Hildesheim, show Nimbi of four patterns. ıat of the symbol of St. John—the Eagle— ıs its field covered with a radiating fleur-de- s ornament; that which invests the head the Winged Man (not an angel be it derstood)—the symbol of St. Matthew— many-rayed, resembling the one illus- ated in Fig. 22; that of the symbol of St. ark—the Lion — has a narrow, rayed rder; and that of the symbol of St. Luke the Ox—has a plain border round a plain ld.

The Nimbi of the Apostles are invariably rcular; generally with perfectly plain fields, ith or without borders, and occasionally namented or inscribed. In their por- aitures, the Apostles are usually delineated aring their distinctive emblems and attri- ıtes; accordingly inscriptions were seldom nsidered necessary by their delineators. In rly as in late art the Apostles commonly pear without the Nimbus.

All the Saints of both the Latin and Greek hurches have been accorded the Nimbus as ıe special sign of their holiness and canoni- tion; and artists have been left free to llow their own tastes in its adornment hen enrichment was desired, or when the aterials in which they worked suggested namentation. Such Nimbi were very ten inscribed with the names of their earers; and this practice must be com- ended, for such inscriptions have fre- ıently proved the only means of identifi- tion. The Nimbus in the form of a circular ate or field of plain gold or colour is, how- ver, the usual and most correct treatment of the attribute distinguishing the lesser saints who have departed this life.

THE NIMBI OF LIVING PERSONS.

It is quite reasonable to expect that during the Middle Ages, when the Nimbus, in its varied treatments, was so generally employed in the portraitures of departed Saints, to indicate their holiness and state of canonisation, that some parallel attribute would be invented or introduced for the purpose of indicating special holiness and dignity in the case of certain persons living—persons whose religious and unworldly lives gave them in the eyes of all men a reasonable claim to be considered and almost approached as saints. Christian Art was not behindhand in this matter and speedily introduced what seemed an appropriate attribute, with sufficient contrast of form, however, to prevent its ever being confused with the Nimbus proper.

From the earliest times the circle has been accepted as the emblem of eternity and heaven; whilst the square has, in like manner, been adopted, in contrast of form, to symbolise this life and the earth. Here, then, was an idea for artists to work upon; and, accordingly, we find in almost all cases that the Nimbi of living persons, or the attributes which were introduced in their portraitures executed during their lifetime, are based on the square, and have no affinity whatever to the circular or more perfect form. At what date the practice of delineating living persons with the rectangular Nimbus was commenced is uncertain; but examples exist of so early a date as the 9th century. The portraiture of Pope Pascal in the mosaics of the church of St. Cecilia at Rome, executed about the year 890, shows the Pontiff standing erect, bearing the model of a church in his arms, and having his head invested with an upright rectangular Nimbus. The side lines of the attribute rise vertically from the shoulders, and are connected a short distance above the head by a horizontal line. Other instances of about the same period are furnished by the mosaic picture which adorned the *triclinium* of San Giovanni di Laterano, built by Pope Leo III., under Charlemagne.* This picture, which we understand still exists in an injured and badly restored state, represents St. Peter seated on a throne, handing a standard to Charlemagne who kneels on his left, and a stole to Pope Leo who kneels on his right. Both the kneeling figures are invested with upright rectangular Nimbi identical with that above described. St. Peter has, of course, the usual circular Nimbus.

At this point we may give an interesting quotation from M. Didron's instructive book. He says: "At Rome, in the ancient basilica of St. Peter, there was a series of Popes painted originally at a very remote period. In the thirteenth century this gallery of Roman Pontiffs was repainted by command of the Pope, Nicholas III., who had it placed somewhat lower down. In the new gallery, Pope Liberius was represented with a square nimbus. The painter employed by Pope Nicholas in the work of restoration had scrupulously copied every figure in the ancient gallery, in which the nimbus of Pope Liberius had been rectangular, and appropriately so as regards the ancient work, since that portrait was dated, in all probability, from the time of that very Pope. It could not, however, be applicable to a portrait drawn in the thirteenth century; and the painter, doubtless, imitated the figure of the nimbus without regard to its signification, or considering the important meaning attached to the rectangular form. This peculiarity is, even now, the subject of critical discussion among archæologists and antiquaries. We believe, however, that the signification here given is correct.

"The Benedictine monks of Solesmes, who have devoted much attention and research to the study of the square nimbus, give a very different explanation of this circumstance. (*Origines de l'Eglise Romaine;* Paris, 1836). 'We must take leave to remark,' say they, 'that the difference in the manner of representing Liberius may possibly have arisen from the fall of that Pope (Liberius had confirmed the condemnation of St. Athanasius, who was persecuted by the Arians), and the slighter veneration with which he was in consequence regarded by the Roman Catholic Church. It appears that he was never honoured by that Church with particular worship, as was the case with all his predecessors, and a great number of his immediate successors. The inferior estimation in which his memory was held may have been thus expressed by an external sign.' This explanation is ingenious; but it does not appear to be strictly archæological. It will serve, however, to confirm the opinion already set forth of the symbolic signification attached to the square nimbus, namely, that that figure is inferior to the circle, and that the square, or rectangle, is a circle broken and diminished. It may," continues M. Didron, "have been given to Liberius, as the Benedictines imagine, in order to make a degrading distinction between him and the other Popes, who are adorned with a circular Nimbus, just as, in heraldry, one abates, by marks of degradation, the armorial bearings of an attainted noble, or of a noble who has forfeited his rights."

There seems to us little doubt but that a mistake or oversight of the thirteenth-century artist has been the cause of the rectangular Nimbus being retained in the portraiture of Pope Liberius; but it is just possible that Pope Nicholas instructed the artist to make an exact copy of every ancient portrait, and to take no license whatever in the reproductions. We must direct attention to the fact that the rectangular Nimbus seems to be confined to Italian art, and that no trace of its use has been found in the portraitures of the Greek Church.

After the perfectly plain upright rectangular form, the most common form is that which seems to be derived from a scroll or roll of parchment. The scroll is represented almost entirely unrolled, and placed upright behind the head. In the accompanying illustration, Fig. 26, from an Italian miniature of the eleventh century, two additional forms are shown. The smaller one is a modification of the ordinary upright rectangular Nimbus, and appears to represent a panel in a frame, although the artist may have intended to simply relieve the plain field with a border, in the manner so often met with in the circular Nimbi. The intention of the larger Nimbus is somewhat obscure. It generally

* "Le plus ancien et aussi le plus important des monuments que Rome a consacrés à la mémoire de Charlemagne, est la mosaïque qui nous reste du *Triclinium* de Leon III. . . . Cette salle magnifique était destinée aux réunions solennelles que le séjour des empereurs à Rome pouvait rendre nécessaires, quand ils viendraient recevoir la couronne dans la basilique de Saint Pierre."—*Annales Archéologiques*, Vol. VIII. p. 252.

resembles the treatment of the scroll Nimbus, above alluded to, but here the sides are bent sharply, and not curved inwards. It has been suggested that a triptych or three-fold picture is represented, but this idea hardly commends itself. We are disposed to accept it as a rude rendering of the open scroll, or, perhaps, a folded document, although the roll held in the priest's left hand does not seem to favour our reading. We may conclude our remarks on this branch of our subject by a few pertinent words from the able pen of M. Didron. Speaking of the rectangular Nimbus as used by Italian artists as the attribute of persons represented during their lifetime, he says:—"The nimbus is of extreme importance, as it affords a clue for ascertaining the exact age of mosaics, manuscripts, and other monuments of art, all of which may unquestionably be assigned to the period at which any personage, represented in them with a square nimbus, was living. It is a subject of much regret that France has not in this respect imitated Italy, and reserved the square nimbus for the living and the round nimbus for the dead. Had this plan been universally adopted, we should now be enabled to fix with great certainty the date of various monuments of sculpture, painting, and even architecture, the age of which is still matter of discussion and will probably continue so for ever without the possibility of determining their exact epoch."

(*To be continued.*)

THE HYDROPATHIC ESTABLISHMENT AND ITS BATHS.—III.

By R. Owen Allsop, Architect.
(Author of "The Turkish Bath: Its Design and Construction.")

THE commercial success that attends the hydropathic establishment, when promoted in all earnestness, and carried on under firm and resolute management, is demonstrated by the growth and prosperity of "Smedley's." The present flourishing condition of the establishment belonging to the Smedley Hydropathic Company, Limited, so pleasantly situated, overlooking a grand expanse of Derbyshire hill and dale, is an example of what steady perseverance and firm adherence to principle can accomplish. Originally owing its existence to the enthusiasm of the late John Smedley, the first "establishment" on the site of the present extensive building was a mere cottage. Herein a few sufferers placed themselves under Mr. Smedley for treatment on that system of water-cure in whose cause he had become enthusiastic by reason of the great benefits he himself had received at the establishment at Ben Rhydding in Yorkshire. From that time to the present day the management of Smedley's has been carried on with strict reference to the purposes for which it was established, and in accordance with the principles upon which the system of hygienic medicine called "hydropathy" is based—a system, however, modified in a measure at Matlock, as it is more or less at other hydropathics. The result of this persistent endeavour in one direction has been unwavering success. In the course of a comparatively small number of years, by gradual means, the institution has developed till at the present time it is of sufficient size to accommodate little short of 200 patients or visitors. Since it was transferred from Mr. Smedley's hands to those of a limited liability company, it has been the subject of more extensive and elaborate alterations than any hitherto effected—alterations which include the addition of a sumptuous dining-hall, and a drawing-room second to none in score of completeness and beauty. When Mr. Smedley's connection with the institution ceased, the medical supervision devolved upon Dr. B. W. Hunter, M.D., formerly of the Bridge of Allan Hydropathic Establishment in Scotland. Dr. Hunter has ever since held the position of consulting physician at Smedley's, his name as a hydropathic practitioner having become of world-wide renown. To his long experience and unremitting adherence to hydropathic principles the continued success of Smedley's is due.

The extent of the present building is shown by the plans of ground-floor, which, owing to the kindness of Mr. A. H. Douglas, the energetic manager, I am enabled to publish, together with plans of baths and basement. The building consists of ground floor, with sitting and dining-rooms, &c., a basement for stores, &c., and three bedroom floors. The baths are not, properly speaking, in a basement, as the ground rapidly slopes towards the Derwent river, and the bath-houses are thus above ground. A bridge from a landing in the old wing crosses the street, and communicates with a building over the way, where is sleeping accommodation for female servants, having underneath a steam laundry, and near by a room for engine and dynamo for electric lighting. The plans do not show the secondary building.

The polygonal portion, at top of plan, is the "old wing"; the rectangular portion, at the bottom of plan, is the "new wing," both being built in Mr. Smedley's time. The new block between the two, including the beautiful drawing-room and dining-hall, and kitchen, &c., has been erected by the present company from the designs of Mr. Statham, architect, of Nottingham and Matlock.

Entering by a handsome vestibule into a spacious hall, we find in convenient positions an office and a reception-room for serving meals to newly-arrived visitors. Close by is the passenger lift to upper floors, and on the other side of the hall the handsome main staircase, behind which is a gentlemen's lavatory. The sale-room, entered from hall, is for the sale of hydropathic appliances, baths, &c. The main corridor abuts on a corner of the hall. Past a secondary corridor at right angles that admits to the grounds and terrace walks, are rooms for manager and matron. On the north of main corridor is the spacious dining-room, with coved ceiling and top-lighted. Doors on the other side of corridor admit to a private dining-room—useful for nervous invalids unfit to take meals in the public dining-room—and to ladies' and gentlemen's cloak-rooms, through which may be gained the drawing-room, provided with an excellent stage for amateur theatricals, recitations, &c., arranged by the visitors. The dining-hall communicates, by means of a servery, with the kitchens, which are provided with ranges, roasting-fire, and steaming oven. The still-room adjoins kitchen and servery. Adjoining the scullery is the bakery. In the range of small buildings adjoining are meat and fish larders, and storerooms for provisions, and clerk of works' room. Off the kitchen is the dish-room, and above servery is a plate cleaning room.

Off the corridor of the west wing is the gentlemen's reading-room, to which is attached the billiard-room. Adjoining the latter apartment is the physician's room, connected with a waiting-room and ladies' room. This portion of the plan may be noticed as particularly suitable and convenient. Gentlemen, if they have long to wait for their interview with the doctor, may find interest in the billiard and reading-room, and ladies indisposed to remain in the public waiting-room, may retire to their own room adjoining. The remainder of this portion of the plan is taken up with a ladies' lavatory, a gentlemen's lavatory, and bedroom. The fine general reading and writing-room close to the hall, and near the stairs to the baths, was formerly the drawing-room.

The first floor is devoted to bedrooms with necessary conveniences and housemaids' closets; and the same may be said of th second and third floors. Off the corridor o first floor will be noticed a lobby, allowin of access to a spacious balcony. Severa verandahs and covered balconies are arrange on the garden side of the building, and thes admit of a certain amount of exercise in ba weather. This, it is to be observed, is most important point. Hydropathy, i should be remembered, is not merely th "water-cure." This is a popular delusion and very harmful to the cause. Hydropath is a system of hygienic medicine, calling t its aid every auxiliary calculated to promot health. Without regimen the "treatment is vain. Exercise, diet, early hours, an regulated living must be studied, togethe with the bath and bathing. Taking the firs of these, exercise, we find that it must b persisted in regularly, and in all weathers Moreover, a certain amount of exercise i often prescribed by the hydropathic practi tioner after bathing and treatment. It there fore becomes of the highest importance tha some provision be made at hydropathics fo invalids to exercise in places protected fron the inclemencies of the weather. In a mode institution this object would be best effecte by appending to the main building a elongated glass structure of the "Winter gardens" type.

Referring again to the ground-plan o Smedley's, adjoining the reading-room ar the stairs leading to the bath-houses. Passin under the reading-room, a corridor i reached, which, besides leading to a smoking room, allows access to the ladies' baths, to th gentlemen's baths, and to the Turkish bath The suite of ladies' and gentlemen's bath are practically identical in arrangement Each consists of a corridor, with bath-room and dressing-rooms on either side. In th dressing-rooms are couches, where th patient may be given the various packs bandages, and compresses. Off the centre o the length of each corridor are two douch rooms, containing douche and needle bath sitz baths, and ascending douches. There i nothing complicated about these baths, sim plicity and effectiveness being the order o the day in arrangements under the contro of Mr. Wilson, the head bathman. Never theless, the Company propose to alter an enlarge the bath-houses at an early date preserving, however, their present character The Turkish bath is arranged by the side o the other bath-houses. It has a cooling room with plunge adjoining, shampooing rooms, tepidarium, caldarium, and laconi cum, or "flue room," as it is here called. I one of the shampooing-rooms is erected Russian bath, with open woodwork seat glazed roof, and steam fittings. Adjoinin the furnace-chamber are drying-rooms an boilers for hot-water coils, and for supplyin steam. The Turkish bath was arrange under the direction of Dr. Hunter, the ver effective method of heating — plans an explanations of which it may be useful t give when speaking of baths in detail—bein his own design.

A very large clock has just been erected at th new mills of Messrs. Marshall and Sons, Grimsby and started on the 8th inst. at 6 o'clock in the even ing, exactly twelve months to the hour after th former mill and clock-tower were destroyed by fire The clock shows the time on four dials, each 7ft. 9in across, which are illuminated by electricity. Th hours are struck on a 10cwt. bell. All the wheel are gunmetal, with machine-cut teeth. The escape ment is a double three-legged gravity one, and th pendulum is a compensated one, weighing 2cwt The work has been carried out by John Smith an Sons, Midland Clock Works, Derby, who are now making clocks for Teignmouth, Thorncombe, Eas Garston, Blackley, and other parish churches.

The whole of the large quantity of Ancaste stone used in the erection of the new parish churc of St. Mary's, Hornsey, by both block and wallin stones, was supplied by the Ancaster Stone Company of Ancaster, the church, both inside and out, bein built of stone from their quarries only.



PLANS
OF
BASEMENT, GROUND FLOOR,
AND
BATHS

SMEDLEY'S HYDROPATHIC ESTABLISHMENT, MATLOCK.

THE SOCIETY OF ARCHITECTS.

THE inaugural meeting for the sixth session of this Society was held on Tuesday evening at St. James' Hall, Piccadilly. The chair was taken by Mr. Robert Walker, A.M.Inst.C.E., of Cork, the new President.

The report of the Council, which was read by Mr. Middleton, Secretary, stated that although the increase in the membership of the Society had been less during the past year than in the previous one, yet the interest manifested both by town and country members in the work performed had been much greater. During the session thirty members and one associate have been added to the roll, while there had been five deaths and fourteen retirements, from various causes, leaving a net increase of twelve. The total number on the roll was now 2 hon. members, 375 members, and 12 associates. The meetings had been much more largely attended than during any previous session, and papers were read by the President (Mr. W. H. Seth-Smith), Messrs. Frank Baldwin, W. Woodward, Edgar Farman, George Howe, H. Roumieu Gough, J. Leaning, T. C. Cunnington, G. A. T. Middleton (Secretary), and Alfred Fisher. The Council had met 19 times, and the Standing Literary Committee seven times, and other committees had also met when necessary. The Council reminded members that they were always willing to give advice on matters of professional difficulty if it were in their power to do so. A corporate seal had been obtained, and was now affixed to all certificates of membership; members elected previously to 1889 could have the seal attached to their certificates on application to the Council. The concluding paragraph of the report ran:—"Although the Society of Architects has no official connection with the Architects' Registration Bill Committee, the council cannot close this report without expressing the great regret which they feel at the untimely death of Colonel Duncan, R.A., C.B., M.P., who had charge of the Bill. They believe that in Mr. Wilson Noble, M.P., has been found one whose energy and perseverance will succeed in obtaining Parliamentary sanction to the much-needed scheme."

The report was adopted on the motion of Mr. Sidney Marsland, seconded by Mr. W. Allport; and on the motion of Messrs. A. Howard and C. W. Bevis, of Portsmouth, the balance-sheet was also unanimously adopted.

Mr. Paul Dué, of Christiania, whose name was introduced by Mr. Seth-Smith (ex-President), was elected, by acclamation, as an honorary member, and the following nine gentlemen were elected by ballot as members:—Cornelius George Adames, Pembroke House, London-road, Portsmouth; Kennett John Beecham, Archts'. Dept., L. and N.W. Railway, Euston Station, N.W.; Frederick Blake, Salter Gate, Chesterfield; Charles O'Connor Coslett Donnelly, Johannesburg, S.A.R.; Edward Keenor, Winkleigh, Devon; Ernest Long, 25, Athol-street, Douglas, Isle of Man; William Joseph Ruggier, Gibraltar; William Crawford Ryder, 13, South Mall, Cork; Thomas David Williams, Johannesburg, S.A.R.; and John Edward Woodroffe, Montenotte, Cork.

The PRESIDENT, who was heartily received, then proceeded to deliver his inaugural address, remarking that he regarded his election as a compliment to the provincial brethren, amongst whom his lot was now chiefly cast, and as a manifestation of that spirit of decentralisation which was abroad. Having referred to the successful congress held at Cardiff in August last, he observed that they claimed to be a progressive Society, whose object was to raise the standard of efficiency of their own members and that of the profession at large. The latter object they hoped to effect by inciting them to engage in the same good work. Their concern was, therefore, chiefly with the future; but their course should be shaped having due regard to the lessons of the past. He proposed shortly to consider their relation to their immediate surroundings, and their relations and obligation to the public; and in so doing he hoped to suggest some lines of thought which might take root, and germinate in the form of papers by some of their members or friends during this session, and finally to point a policy; to indicate a distinct and definite work which they should aim at accomplishing, and which, in his judgment, made a first claim upon their attention. The President continued: Our immediate surroundings may be said to be the client on the one hand, and the contractor, with his army of workers, on the other. The latter are our co-workers; and if in any particular we fail to recognise this fact, by omitting to qualify ourselves to speak their technical language—if we do not, or cannot translate our general drawings into clear working drawings and detailed description, our co-workers will fail to impart to the structure, through our default, that strength, fitness, and beauty which we had hoped would be the outcome of our design. To design with strength, fitness, and beauty, it is necessary that we should have a knowledge of the nature and capabilities of the materials with which we build, and this is best acquired by studying the technical language, methods, and art of each trade. The chief constructor should be in touch with his co-workers, and his drawings and specifications should be real guides, and be technically accurate. It may be said that, under existing circumstances, some men would find it impossible to comply with this condition. I quite think so too; but let the objector give the question consideration, and try to devise some means of altering the circumstances so as to render it possible to comply with the condition. In discussing this question with a gentleman in the City not long since, he said, "I need not tell you that half the buildings that are put up, would come tumbling down like a pack of cards only for the practical knowledge supplied by the contractor's staff. Technical knowledge of construction filters up to instead of down from the head. The skilled workman coaches the foreman, the foreman the clerk of works, and sometimes the contractor the architect—Never? Well, hardly ever." This sweeping statement, although it may not be accurate in its extent, contains more truth than is either pleasant to contemplate or creditable to our body. While the builder and his workmen should be as competent to "read" a drawing as the architect who prepared it, the architect should be conversant with the methods of each trade and the possibilities of producing the desired results in each material which he selects. In relation to the client, the first difficulties which the young architect especially has to encounter are arranging terms and taking instructions. The first is disposed of by stating clearly and fully at the outset what the fees of the architect and quantity surveyor are to be. As to the second, "taking instructions," here it is that misunderstandings, often leading to disputes, have their rise; it is necessary that the architect should study his client's requirements, not only from what he says, but from his surroundings, and he should cultivate the use of accurate descriptive language, so as to be able to produce a word picture which will assist his client in giving instructions. In submitting probationary drawings which are meant to test the correct understanding of the instructions, it is necessary to discover to what extent your client comprehends a drawing. Sometimes it is not understood, and then it only obscures the clear impression which may have been produced by the graphic description, which it purports to illustrate, in which case it is wise to lay aside the drawing and repeat the description, and, when the proper time comes, to invite your client to read the specification. In every case, during the progress of the works, where additional works are ordered, attention should be called to the fact that increased outlay is being incurred, and the exact sum, if possible, ascertained and noted in the order given at the time. I need not refer to the clients who can prepare an outline plan, and state clearly their requirements, beyond saying that it is pleasant to work for them. All buildings upon which architects are called to exercise their functions demand, in a greater or less degree, careful study of the purposes for which they are destined. This involves acquiring a knowledge of the operations to be carried on, so as to devise the required sequence of its parts, adapting each to its several uses, and providing the best possible arrangement. The architect must not only have a perfect knowledge of the language which he speaks and writes in, but he must have, if he is to be successful, a well-trained mind, with all its powers cultivated, his reason and judgment matured, he must have a clear perception, and be full of resource. Mere knowledge without wisdom, without the power and skill to apply it fittingly, is not sufficient; training and technical knowledge will not take the place of natural gifts. Aspirants to our profession require to receive a liberal, general, and special education, and technical training to develop the maximum of good results in each. There will, however, be always that difference in the power of designing with beauty and efficiency between them which is due to the difference in degree in which each possesses natural gifts, capacity, and fitness. The special education and training of those intended for the profession of architecture is of the first importance, and should commence in early life. There is a certain basis of elementary education which is common to all pursuits; but when that limit is reached the special subjects and technical training should commence, and this after carefully testing and discovering special aptitude. This policy points to a complete system of education which includes the hands as well as the head, and which may possibly be promulgated by our paternal Government, when, some time in the future, it may have leisure for the discharge of paternal functions. In the mean time, we must rely on our own efforts for improvement. That our profession suffers from incompetent and unqualified practitioners has been acknowledged for many years, and needs only to be stated here for my present purpose. The fact has been demonstrated in papers read in this hall and elsewhere. I cannot but believe that some of the incompetent men feel the misery of attempting to discharge functions for which they possess no knowledge or fitness, and may feel tortured at the sight of their own faulty, dangerous, and hideous creations; if they do not, others do. I can feel sympathy for such men, if any exist, for probably the tide of circumstances drifted them hopelessly into the false position. But there are many others, for Providence is merciful, who deceive themselves, and are not conscious that they labour under any disability. Some men are colour-blind, some have no taste; some no sense of deformity when the horror is conceived by themselves; some have no moral perception, but have the courage of ignorance, build unstable walls endangering life, and provide for slower death by poison introduced through unsanitary appliances and methods, and a host of other evils and troubles which have been frequently scheduled, and are inflicted on the public under cover of an assumed title worn with placid effrontery because there is no remedy against the practice. I am not aware that these sinners commit the sacrilege of entering the domain of Art, and am not in a position to sustain an indictment against them in the æsthetic regions. So far as I know, they do not soar so high as to commit artistic crimes. In this matter "the boot is on the other leg," as my censorious friend said, if I may be pardoned for again quoting that gentleman. He was very strong upon this point. When I asked, "How do you propose to deal with the unquestioned absence of technical training and scientific knowledge in the men whose duty it is to guide the builders?" he answered, "There is no use in trying to educate them, they are too idle, and have no taste for acquiring the necessary knowledge, they will get on somehow as they do now—they are pulled through by the builders. You must know, as I do, that the great majority could not prepare a detail drawing, showing the construction of any portion of a building, and as for scientific attainments, in the great majority of the profession it is an unknown quantity. Then, again, the builders rely on their foremen, and a good clerk of the works plays an important part in carrying out a structure, and they in their turn rely on the skilled workmen." If this be true, in any instance, the head and tail have changed places, and we have an illustration of the "last being first and the first last." I have here quoted the views of a strong opponent of the Registration and Education Bill now before Parliament in a modified form, and this brings one to the policy to which I point as worthy of the Society of Architects' persistent efforts to accomplish. It will raise the standard of excellence of the profession, and thereby benefit it and the public alike, and I trust, if you agree to the proposition, the efforts used will be marked by a due and courteous regard for the opinions of members of the profession who may hold at present a different view, and whose experience would be invaluable in shaping the details of the measure if their judgment went with the proposal. I hope that the members of the profession, outside the 1,300 who have already pronounced in favour of the measure, will consider it so as to master its details. It is before them in the form of "papers" and a draft Bill, easily procurable

The object and scope of the measure before Parliament may be gathered from the third section, which reads:—(3) A Council which should be styled the General Council of Architectural Education and Registration of the United Kingdom hereinafter referred to as the General Council shall be established, and branch Councils for England, Scotland, and Ireland respectively formed thereout as hereinafter mentioned." The Bill is drawn in a similar manner to numerous kindred Acts already passed by Parliament, and its provisions throughout are based on principles which Parliament has endorsed and promulgated as being wise and just. It is only necessary to refer to the Medical Act of 1858 as a precedent which deals with a precisely similar state of things to that which the Architects Bill is designed to remedy, and to which it bears a singular analogy. The subject, as treated in the Bill, is one that lends itself to calm discussion, and I trust that the further consideration of the measure will be marked by an absence of personalities. The first effect of the Registration Bill if passed will be to put a stop to any further increase in the numbers of incompetent practitioners; but in doing so the vested rights of all men in practice will be respected. This is simply honest, and Parliament would not consent to the absence of this provision in the Bill, which is a principle observed in all enactments of a similar kind, and the obstinate attempt to exclude it from the Medical Act was the chief cause of delaying its passage for 30 years. This provision, the principle of which is an axiom of Parliamentary practice, is objected to, as giving status to unqualified persons, by the very people who slept while the tares were being sown by the enemy of their own neglect and indifference. The effects of that neglect they now propose to root out, but the old instruction says, wait until the harvest (of education) comes. Until then let both grow up together, time will remove the tares by a natural process without violence or disturbing the equilibrium of the present state of things. All reforms, to be just and beneficial, must be initiated in a spirit of compromise, and the process must be slow. The opposite objection to the last stated has been urged against the Bill to the effect that the measure is, by its restrictions, adverse to the growth of art, by the possible exclusion from the profession of an unborn genius, who is to have no capacity for being educated. Of course, this objection was meant as a joke, and requires no comment by way of refutation, but some few regarded it as serious. In 1886 the Registration Committee, which had been appointed by a conference held on April 6th of that year, sent out a declaration to the leading members of the profession to the extent of 2,500 in favour of a Registration and Education Bill; 1,300 were returned signed and approved, and only three expressing doubt or disapproval. This was a larger proportion than usually marks the interest which men take in elections to office in clubs and institutes, and is accordingly very significant. I have confined myself in these remarks chiefly to some of the prosaic features of our everyday office life, and perhaps I have been led to do so, in some degree, owing to having received letters from time to time from young architects seeking for guidance in the most elementary matters. I think, however, the public taste is growing in the direction of appreciating and approving of that beauty in architecture which grows out of the fitness and construction of our buildings. The relation of construction and fitness to the artistic form and finish of our buildings is the same as that between the scales in music and the finished composition; the themes are endless, and the mode of treatment subject to no limit but that imposed by the degree of technical knowledge and genius of the composer. The burden of my remarks deals with the unqualified practitioner, who in most part, if not in every case, is found outside the limits of professional bodies; but there are also a great number of men of marked ability and many distinguished men who have not allied themselves with any society or institute. This is not well; they may not gain any personal advantage by joining, but the hands of those who are working for the common good, by all qualified men joining one or other of the many professional bodies already established in town or country, would be greatly strengthened. I think you have done something towards the healthy efforts which are being made in several quarters to deal with important matters. Provoking unto good works is an old method. I wish them heartily complete success. A very few years ago one was led to ask, looking out upon the mass of lifeless indifference that has marked the members of our profession in matters relating to the common interest, "Can these dry bones live?" There are signs of life! One observes a movement—a shaking amongst the inert masses. Some of the leaders of our profession have spoken words of wisdom worthy of their positions and high attainments. I trust that they will bear good fruit. There appears to be one great disability in promulgating measures for our advancement: there are no available funds. The Registration Bill provides the necessary funds for the education which it promulgates. Education is the substantial and vital force of the measure, which is to work out the gradual rising of the standard of attainments and efficiency in the aggregate of practitioners. It is the little leaven which will leaven the whole lump. I venture to hope, therefore, that all the members of the profession will give this Bill their careful consideration, and ultimately their support, when it must be carried.

A vote of thanks to the President for his practical address was proposed by Mr. W. H. Seth-Smith, seconded by Mr. A. Stoner, and having been supported by Messrs. H. Roumieu Gough, George Thomas (of Cardiff), and J. N. Porter, was carried by acclamation. In responding, Mr. Walker urged that the movement should take the form of an educational rather than a mere registration one, and strongly advocated the adoption of a conciliatory tone towards those who at present had not been convinced by argument of the soundness and wisdom of their proposals.

BUILDERS' BENEVOLENT INSTITUTION.

THE forty-second anniversary dinner in aid of the funds of this Institution took place on Thursday, the 7th inst., at Carpenters' Hall, London Wall. The chair was occupied by Mr. James W. Hobbs, J.P. (Mayor of Croydon), president of the Institution; and there were also present Mr. Banister Fletcher, F.R.I.B.A. (master of the Carpenters' Company), Sir George Chubb, Mr. George Plucknett, J.P. (treasurer of the Institution), Mr. Steere, Mr. H. H. Bartlett, Captain Dibley, Mr. T. F. Ryder, Mr. J. H. Colls, Mr. W. Robertson, Mr. T. G. Smith, Mr. Burt, Mr. R. L. Curtiss, Mr. Thomas Stirling, and other friends of the Institution, the whole company numbering about 170.

The Chairman first proposed the toast of "Her Majesty the Queen, the Prince of Wales, and the rest of the Royal Family."

Mr. H. H. Bartlett gave "The Army, Navy, and Reserve Forces," Major Brutton responding for the Army and Navy, and Colonel Banister Fletcher for the Reserve Forces.

The Chairman then proposed the toast of the evening, "Success to the Builders' Benevolent Institution." He stated that since the foundation of the institution 142 men and 102 women had been elected as pensioners, making a grand total of 344, whom they might claim to be rescued from serious anxiety and poverty. (Applause.) At present there were 24 men and 36 women on the fund. Some of those who had received benefit from the institution had at one time been in great affluence, showing how necessary it was for those who were in prosperity to do all they could in the way of alleviating the sufferings of those who had once stood in the same position. He supposed there was no trade which had more vicissitudes than the building trade. A builder might have many thousands of pounds honestly coming to him, but such was the peculiarity of his life that many delays seemed to crop up to force a man into a condition of things which was little short of appalling. Thus, though a considerable sum of money might be due to the builder, a fifty-pound bill returned might entail bankruptcy and ruin; that being the case, it was astonishing that so many builders failed to support this most deserving charity. In this country there were a million and a half people engaged in the building trades, and in London alone, according to the last census, no less than 224,000 people made their living by it. In London there were also 1,103 architects, 1,626 builders, and 434 surveyors. Looking at the income of the institution, he could not consider it as properly representative of the great industry in whose interest the fund was established, and he expressed the hope that the result of his appeal would be a substantial addition to the funds of the institution.

Mr. George Plucknett, J.P. (the treasurer), whose name was associated with the toast, replied on behalf of the institution, remarking that if the builders of the metropolis would only subscribe in their prosperity, the anxiety on the part of the committee would be relieved, and many more pensioners could be elected. (Applause.)

Mr. R. L. Curtiss (Mayor of West Ham) gave "The Worshipful Company of Carpenters," to which Col. Banister Fletcher (Master of the Company) responded. He stated that the Company was doing all in its power, by the establishment of technical schools and examinations, to advance the craft, and he hoped the builders themselves would give the work their help and countenance.

Mr. A. Ritchie proposed "The Health of the Chairman and President," a toast which was received with acclamation.

The Chairman briefly replied.

Sir George Chubb gave "The Architects and Surveyors," to whose exceptional ability and perseverance he paid a warm compliment.

Mr. H. Chatfeild Clarke responded, remarking that the great buildings of the metropolis showed that the architects were doing their best for London of the present day. He also referred to the value of the surveyors, and the esteem in which they are held.

Mr. W. H. Gibson proposed "The Vice-Presidents, Committee, and Stewards," to which Messrs. W. Shepherd and C. Bussell responded.

"The Ladies" having been given, the proceedings came to a close.

In the course of the evening subscriptions to the amount of £912 were first announced, of which sum £674 appeared in the President's list. A further appeal from the chair realised another £50, and the Chairman intimated, amidst applause, that he would make up the amount to £1,000.

THOMAS DE LA WARRE'S COLLEGE (NOW CHETHAM'S HOSPITAL), MANCHESTER.

THIS structure stands on an ancient fortified site, and was completed about the year 1425 by Thomas de la Warre, the Priest Lord. It is built in the Perpendicular style, of dressed stone, and the walls are about 3ft. thick. The roofs were originally covered with stone slates, part of which are now replaced with modern slating. The dining-hall, audit-room, and reading-room over have been extensively repaired; the two last were altered and decorated probably about the middle of the 17th century. The dining-hall was originally used as a refectory by the Wardens and Fellows. It is 43ft. 4in. long by 24ft. 2in. wide, and about 36ft. high to top of roof; at one end is a dais surmounted by a fine panelled and battlemented canopy, and at the other end three massive oak screens. The audit-room has an oak dado all round 8ft. high, and above is a floriated plaster frieze running up to ceiling; the ceiling is divided into nine panels by massive moulded oak beam, with four bosses, delicately carved with grotesque subjects at the intersections. The reading-room over is panelled all round with oak panelling and well-moulded cornice, which is ornamented with a leg of an eagle and a Tudor badge. The former is a well-known cognisance of the Stanleys, who were connected with the building previous to its being founded into a charitable institution by Humphrey Chetham. The fireplace side is richly ornamented in honour of Humphrey Chetham; the old plaster ceiling has been removed, and the roof has been thrown into the room. It was after the civil wars that Humphrey Chetham founded it into a charitable institution, and since August, 1656, it has had the name of Chetham's Hospital.

The Duke of Westminster opened on Saturday a new garden in Duke-street, Grosvenor-square, laid out by him on part of his estate from which old, worn-out tenements had been removed. It comprises a little more than one-third of an acre, and consists of grass and plane trees, with broad, asphalted paths. This open space is part of a general scheme of improvement, which embraces also the erection by the Improved Industrial Dwellings Company, under building leases, of large blocks of working-class dwellings. These will accommodate some hundreds more persons than the improvement will have displaced.

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OUR LITHOGRAPHIC ILLUSTRATIONS.

ROOD SCREEN, RANWORTH, NORFOLK.

THE remarkable screen in this church furnished the subject of some correspondence in our pages a few weeks ago, and we are now enabled to publish some drawings of it, by special permission of the Norfolk and Norwich Archæological Society, who issued some time since a most useful monograph of this grand piece of work, with drawings specially prepared by Mr. C. J. W. Winter. We give the general drawing as a key with the plan, and some of the painted panels. Others in further illustration of these choice decorations will appear shortly. The following particulars are supplied by the folio to which we have already referred. The church at Ranworth is without aisles, and consists of a chancel and nave only. The rood screen proper—*i.e.*, the arcade with panels below—is placed, as usual, between the piers of the chancel arch. The rood loft beam with the loft itself extends beyond the opening of the arch, and is continued along the east wall of the nave on either side of the openings to the north and south walls respectively, above a series of painted panels, which served as retables to side altars. These altars are inclosed by wings or parclose screens, forming chapels, doubtless under some special dedication—probably to St. John the Baptist on the north side, and the southern one to the Blessed Virgin Mary. There is no positive evidence as to the date of the work; but there is reason to suppose that the execution of the paintings as we now see them belongs to the latter part of the 15th century. Documentary evidence shows that at this time the people were occupied in repairing and decorating the church. Some points of costume, the character of the tracery, together with the subjects represented, combine to make the above period probable for the date of the paintings, although the screen, no doubt, is earlier. Details of the woodwork will be found in Mr. J. K. Colling's "Gothic Ornaments," Vol. II. The panels which we have selected to-day represent St. Simon Peter holding a fish and St. Thomas holding a spear. St. Michael is depicted slaying the seven-headed dragon. The surcoat and shield *gules* charged with a cross fleuré. The left-hand panels represent St. Mary, wife of Alphæus or Cleophas (St. John xix. 25), with her four children—St. James the Less, St. Jude (Judas *the brother* of James) (St. Luke vi. 16), St. Simon, St. Joseph (Joses the Just). The infant St. Simon, standing on her right side, holds a fish; seated on her left knee, St. Jude holds a boat, with which emblems these saints are also represented on the screen. The two infant saints, James and Joses, play at the feet of their mother, one blowing bubbles, the other with a toy mill! It will be observed that this panel, with the two adjoining ones, include the Virgin and Child and those persons probably related to and known as "the *brethren* of our Lord." "It was surely a charming idea," observes Mrs. Jameson, "to group as children around Him in His infancy those who were afterwards to be His chosen ministers of His Word!" The subject of this panel affords some evidence that the paintings belong to the latter period of the 15th century; for it is alleged by the above writer that groups of this kind became general subjects with painters between 1505-1520, and after that date were no longer selected. The last panel shows a seated figure of St. Margaret crowned Virgin and Martyr, holding a cross staff, with which she pierces a dragon, and having a book in her right hand. The diaper backgrounds are rich with powderings in colour, and all the panels are freely gilt. We are indebted to Mr. F. M. Elgood for the loan of these original prints.

PERSE SCHOOL, CAMBRIDGE.

THE Perse School is intended for the accommodation of 300 boys—all day scholars. The governors decided some time ago to build a new school on a new site, and arranged for a competition. Professor Middleton was asked to judge the merits of the designs sent in, and decided in favour of that by Mr. W. M. Fawcett, M.A. It is to be carried out in red brickwork and terra-cotta. The plans, with the view given to-day, explain the design and its arrangements. The conveniences are to be built in a separate block to the rear.

THE WELSH CHURCH, CARDIFF.

THIS church, which is to be built on a site given by Lord Tredegar in the Howard Gardens, Cardiff, will be commenced early next year. It will be exclusively used for services in the Welsh language, and is to be dedicated to St. David. The plans show accommodation for 450 worshippers. Externally it will be faced with hammer-dressed grey Pennant stone, with dressings in Box Ground stone. The design throughout is in the Perpendicular style, and the more enriched work will be concentrated internally on the chancel and reredos. The architect is Mr. Bruce Vaughan, A.R.I.B.A., of Cardiff.

OLD TOWER, UPPER TOWN, HOMBURG.

THIS illustration is from a photograph kindly placed at our disposal by Mr. A. S. Close. No further particulars are to hand.

SHOPS AND RESIDENTIAL CHAMBERS, SHAFTESBURY-AVENUE.

THIS building is faced with red cut and rubbed T. L. B. bricks and Newbiggin stone, and the roof is covered with Eureka green slates. The whole of the floors and the staircases are of fireproof construction, by Messrs. Dennett and Ingle. The building has been carried out by Messrs. Oldrey and Co., of Westbourne-park, under the direction of Messrs. Wylson and Long, of 15, King William-street, Strand, architects.

MOORISH WORK FROM SPAIN.

IT would require an abler pen than mine to describe with justice the architectural beauties and to enumerate the details of such buildings as the Mosque of Cordova and the Alcazar of Seville. I shall content myself by giving a small description of the two illustrations accompanying these hurried notes. The Court at the Alcazar called Patio de las Munecas (the Dolls' Court) belongs to the finest epoch of the Moorish art, and is almost a perfect specimen of the last period of their architectural art in Spain. The Alcazar itself, which was begun in 1171 A.D., was reconstructed between 1353 and 1364. The style of this building is certainly more Byzantine and not so fine as that of the Alhambra, though in some cases the inscriptions and mosaics are richer and more complicated. Beyond this court is seen the Court of Ambassadors. The Mosque of Cordova, where originally stood a Roman temple, was built by the Arabs in 786-796 A.D., but for several years after additions were made to it. When King Ferdinand took possession of the town he put a provisional altar in the very centre of this Moslem temple, and later on, in 1521, permission was granted by Charles V. to erect a Gothic cathedral in lieu of it. Thus we have, one within the other, two very beautiful temples, but the later addition cannot compare in beauty with the one built by Abd-el-Rhaman. The Mosque proper is 642ft. long from north to south, and 462ft. broad from east to west, and contains nearly a thousand columns.—F. P. CEMBRANO, JUN.

NEW BOARD SCHOOLS, WHITEWELL-BOTTOM.

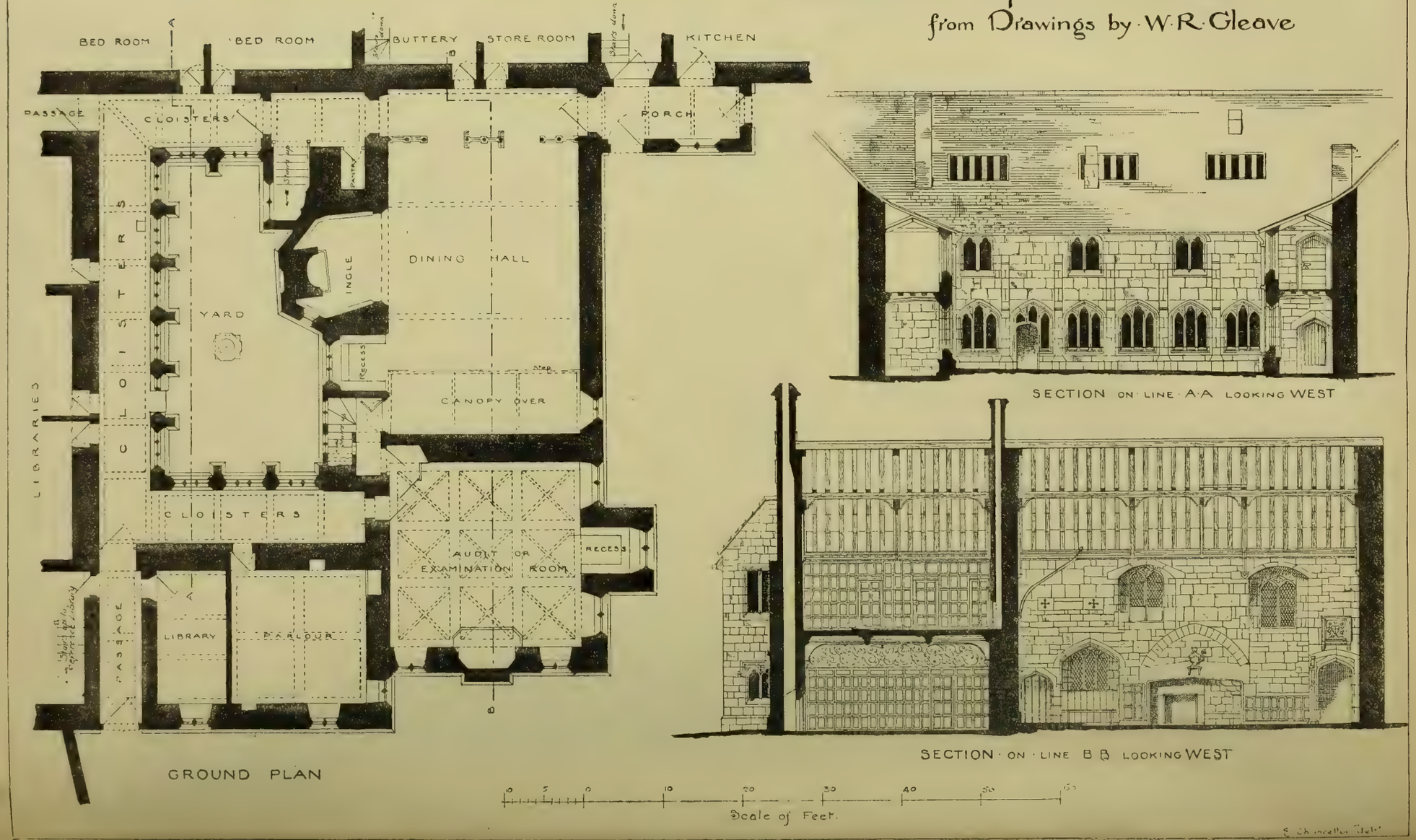
THESE schools have been erected for the Newchurch-in-Rossendale School Board, and were recently opened by Mr. F. A. S. Freeland, B.A., H.M. Inspector of Schools for N.E. Lancashire. The buildings are erected on a site containing about 1,978 square yards, and are one story in height only, accommodation being provided for 272 children—167 boys and girls and 97 infants—each child having ten superficial feet of floor space. The general schoolroom is 76ft. by 22ft., and will be used for boys and girls. It may, however, with ease be converted into three separate classrooms, one for 80 and two for 40 children, by means of revolving shutters. By this arrangement the large room may be used for purposes of a general character, and class teaching may be more efficiently carried out when the room is subdivided and fitted with "dual" desks. The infants' department includes a large room, 30ft. by 20ft.; a babies' room, 21ft. by 18ft. (with gallery), which latter may be used as a board room. The whole of the rooms have thoroughly efficient through light and ventilation, the former being well diffused in every part, and the latter maintained by means of fresh-air inlets through the window bottoms at each side of schoolroom and upper portions of each window, the vitiated air being drawn away through ornamental perforated ventilators in the ceiling by Boyle's patent extractors. The heating of the schools, classrooms, and corridors is by means of hot-water pipes, on the low-pressure system, laid on the most approved modern principle. Separate entrances to the school buildings and exits to playgrounds have been provided for the boys, and girls and infants. Access to the various departments and classrooms is obtained by means of a well-lighted corridor, 6ft. wide, which extends the entire length of the building, and may be used for marching the children in inclement weather. Two extensive playgrounds—one for boys and the other for girls and infants—are situate at the rear of the buildings, having a western aspect. Covered playsheds have been arranged in each playground, for use during wet or inclement weather. The buildings form a pretty picturesque group, the roofs being artistically broken up by means of gables and dormers, which, whilst adding beauty to the general design, materially assist in the lighting and ventilation of the various rooms. A clock-tower at the north-east angle of the building, over the boys' entrance, gives a finished appearance to the general design. The buildings are faced throughout with coursed parpoints of local stone, relieved by tooled dressings to windows, arches, buttresses, &c. The roofs are covered with best Velenhelli slates. All internal woodwork is of pitch-pine varnished, and the external is of red pine painted four coats. The internal walls have a dado of cream enamelled bricks, 5ft. in height, surmounted by chocolate moulded capping. The following contractors have brought the buildings to a successful conclusion: Mr. William Coupe, Newchurch, excavator, bricklayer, and mason; Mr. Robert Whittaker, Whitewell-bottom, carpenter and joiner; Mr. Henry Tomlinson, Rawtenstall, slaterer and plasterer; Mr. Robert Clegg, Bacup, plumber, glazier, and hot-water apparatus. The whole of the works have been carried out from the designs and under the personal supervision of Mr. Thomas W. Cubbon, architect, of Birkenhead and Douglas; Mr. A. E. Emmett acting as clerk of works.

The church of St. Thomas à Becket, Pucklechurch, which has undergone renovation at a cost of £1,250, was reopened on Friday. The walls, which were out of the perpendicular, have been straightened and new foundations put in; the columns have been served in the same manner; a new roof has been put on; new choir seats have been put in the chancel, which has been re-tiled, and heating apparatus has been provided. Mr. J. D. Sedding, London, was the architect, and Mr. S. Turner, Stapleton-road, Bristol, the builder.

The funeral of Mr. Thomas Monk, of the firm of Messrs. Monk and Newell, railway contractors, took place on Saturday, at Woodchurch, Cheshire, and was numerously attended.

Chetham's Hospital · Manchester

from Drawings by W. R. Gleave



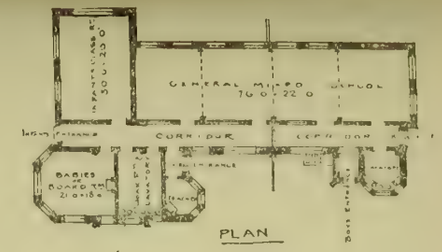
WHITEWELL BOTTOM SCHOOLS

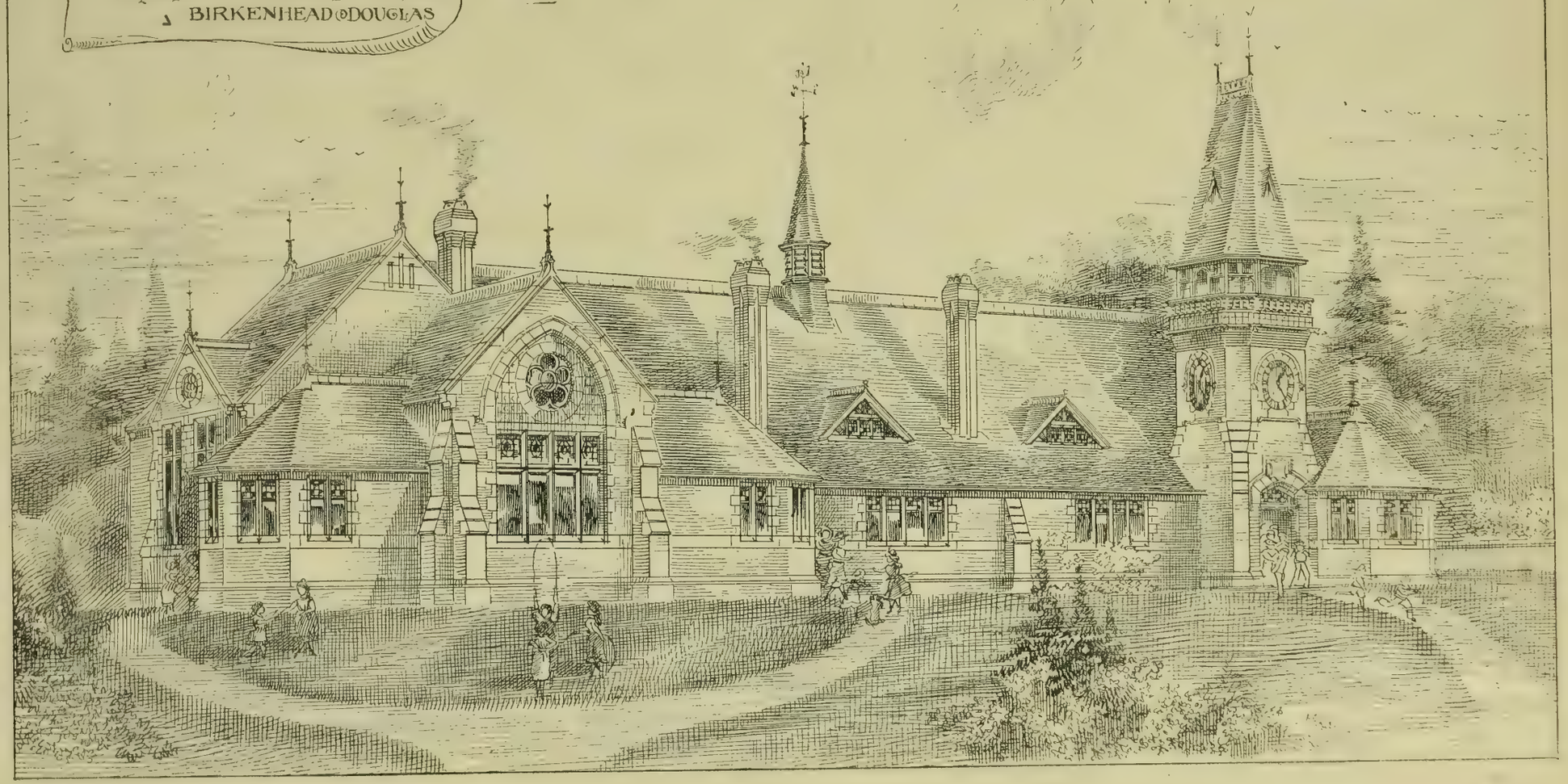
for the

Newchurch-in-Rossendale School Board

Thomas W. Cubbon Architect

BIRKENHEAD & DOUGLAS





WAYSIDE NOTES.

I DULY attended the inaugurative meeting of the Society of Architects, on Tuesday evening last, and was right glad to have had the opportunity so to do, for it is a pleasure to hear anyone speak with the earnestness of Mr. Robert Walker. As I had anticipated, the subject of Registration was not neglected, it, indeed, forming the dominant theme in the Presidential address. In place of the term "Registration," however, Mr. Walker gave reasons for preferring to speak about the *education* of architects, giving it as his experience that the employment of the word "Registration" had in many cases led to a misconception of the purport of the proposed Bill. With the public, doubtless, this is often true, and the evil attendant upon the adopted title of the Bill should be recognised, and endeavours made to counteract it wherever an opportunity occurs. Personally, I should say that the words "examination" or "compulsory examination" of architects would be preferable to any others, since examination includes and supposes education. Inside the profession none, excepting those wishing to deceive themselves and others, can pretend that they have misconstrued the intent and meaning of the Registration of Architects.

The remedy for the misconception on the part of the public lies partly in the hands of all who hold Registration to be above all things desirable for the future welfare of the profession. Each one, by neglecting no opportunity for explaining the true scope and intention of the present drafted Bill, may do much to remove false ideas upon the subject. I cannot refrain from repeating again and again that the one fact to be eternally dinned in the public ear is that the architect of to-day passes no compulsory examination before he may practise. Although since the commencement of the agitation by the Society of Architects a great amount of light has been shed on all sides, the ignorance that yet remains is astounding, and, had not such marked progress already been made, would be well-nigh nigh disheartening. It is wearying in the extreme to have to keep combating this ignorance, the only comforting thought being that we have to suffer from no backsliding, for, once brought to see the truth, our man is a Registrationist for all time. So, as some great personage said, there is nothing to do but "keep on pegging away."

I would draw the attention of those who were not present to hear the address, to Mr. Walker's sketch of the difficulties attendant on the gaining of the Medical Act of 1858 by the body of gentlemen who grieved at the evils wrought by the unrestrained blunders of the "quack." Especially would I ask all to reflect upon the statement made by Mr. Walker that, according to Lord Elcho, "the Medical Act was under the consideration of Parliament for thirty years, owing to the persistent opposition of the Colleges of Surgeons and Physicians," and that "in 1858 they at length gave way, on obtaining the positions similar to those given to the R.I.B.A. in this Bill." If this is not admitted to be at once remarkable, encouraging, and justifying of the labours of the Registration Committee, it will only be by those who are too dull to perceive the extraordinary analogy between the present position of architects and the R.I.B.A., and the earlier medical practitioners and the College of Surgeons and Physicians.

Although considering myself well up in matters pertaining to the Registration question, I must confess to have heard several hard facts stated on Tuesday evening that were new to me, and tend to strengthen one's views on the subject. Mr. Gough gave some figures respecting the number of Fellows and Associates that petitioned in favour of the recent Architects', Engineers', and Surveyors' Registration Bill. The large proportion of members who thus petitioned against their own Society—a line of action that few would have pursued unless feeling almost passionately on the subject—may be taken as some index to the temper of a still larger number who, more fearful of expressing their own minds, and not having the courage of their convictions, remain silent. I make bold to say that there are few Fellows, and fewer Associates, out of whom I would not draw a private confession of the desirability of making a "close" profession of the architect's calling. How many have said to me that registration is wanted, but that they did not think that the present measure was the right thing in the right place! Why? Because, they would find if they reflected on the nature of their feelings, it is not promoted by the big Institute, but by the Society! I would earnestly exhort such as hold this, very general, view to turn the matter over in their minds, and see whether they do not find their conscience urging them to take up a stand more becoming to their good natures, and to let their colleagues at Conduit-street know their views on a question of vital importance, thus encouraging others to frankness and boldness of manner, and tending to weld together that section of the Institute which has already declared itself strongly in favour of a really compulsory system of examination. It is this hesitating body of gentlemen that holds the power of turning the scales, for good or bad, according as they throw in their weight with one party or the other, and are resolved to act and think nobly for themselves, rather than lean upon the opinions of others.

The inaugurative Presidential address to the members of the Surveyors' Institution was delivered on Monday last. Although the surveyor is a man largely concerned with broad acres, yet a disquisition, consisting in the main of facts and statistics connected with agriculture, can scarcely have appeared to him altogether as fascinating and attractive as one dealing with more purely surveying matters. Nevertheless, the concluding remarks of Mr. E. P. Squarey, the President, must have been full of encouragement for his hearers, and in the report of his discourse the words will have proved such as desponding young surveyors "seeing, may take heart again."

We have heard much of late years touching the unpromising outlook over the surveying horizon. The pessimist argues that the labours of the Ordnance gentlemen are taking the bread out of the mouths of our private surveyors. In a measure doubtless the fraternity have been affected by the minuteness of the surveying operations of the Ordnance department, the large scale maps prepared having, we may well imagine, often rendered unnecessary an undertaking that would have to have been entered upon by a landowner, which would have been a coveted job to the private surveyor. But is there not, perchance, more in the bark than the bite of the Ordnance bogey, and should not young surveyors look at the matter in the light of the President of the Surveyors' Institution, believing his stated conviction that, so long as separate ownership in property exists, there will always be work for the surveyor? For my own part, I humbly avow myself disinclined to give ear to complaints of the nature of the "vested interest" class, be they in whatsoever trade or calling they may, and to croakings about injuries done to this or that business or profession, believing that matters of this description right themselves, or that the balance is gradually restored by an all-wise Providence. Such seems to have been the case in the world's past history, the most striking instance being the introduction of machinery into manufactures, a movement at first so bitterly opposed by the men labouring in the particular trades, and yet one that ultimately created demands for a vastly-increased number of hands. Anyhow, young surveyors will do well not to despair even if the present outlook be cheerless. They may rest assured that if their chains rust, rather than wear, out, it will be in chief their fault; and they will do well to believe with old Dr. Johnson that the habit of looking at the bright side of things is worth a thousand a year to any man.

The sad death of Mr. Joseph Gordon, who but little more than three months ago was elected to fill the vacancy created in the post of engineer to the London County Council by the resignation of Sir Joseph Bazalgette, will have been heard of with the greatest regret by all. The manner of Mr. Gordon's death reminds me how an old architect friend of mine was wont to hold that heart disease was peculiarly prevalent among the members of the engineering and architectural professions, because of the responsible nature of their duties. I thought less of his opinion, however, when, one day, sad to relate, he was himself carried off by the fatal complaint. For I believe that we are most of us apt to generalise, and thus he, aware of his own weakness, of which I was always wholly ignorant, was prone to consider the course of his life as a type of others. Doubtless over-zealous and greedy study, and that heavy responsibility that presses painfully upon the more sensitive of those engaged in the engineer's and architect's work may be provocative of heart as of brain troubles; but, on the other hand, there are conditions about the life of an averagely successful architect or engineer that should tend to counteract possible ill-effects of the nature. He is a man out and about, in town and country, and does not, like the principals in many other businesses, "toil in narrow cages" the livelong day, to the detriment of health. So even if we occasionally have our E. M. Barry's, I do not see any reason why heart-disease should be considered prevalent among us to a greater extent than the rest of the 19th-century community. And, after all, it may be said that care and anxiety for the safety of works and safe issue of undertakings, if not actually sinful, are self-created evils, since the man whose every doing is based upon sure foundations—I desire this expression to be understood in its widest sense—should be free from harassing care. But those who, being of a highly nervous temperament, take upon their shoulders the responsibility of an engineer or architect, while, through want of experience, lacking that sterling knowledge of construction that insures perfect confidence, must find each new undertaking a source of constant anxiety, which in time may do irreparable mischief to their constitutions.

I see that the case of "Gibbs v. Grimthorpe" came on for trial last Saturday. The most noteworthy thing about the report of the case, as it stands adjourned for a week, is the curious way in which the amount expended by Lord Grimthorpe has risen to "considerably over £100,000"! Why, even friend "Ars" hesitated to name a sum of this proportion! I should like to have been in court, and shall hope to be there when the case is resumed, and perhaps hear a little more of the evil doings of the "Sandballats and Tobiahs, Arabians, Ammonites, and Ashdodites—*i.e.*, Antiquaries, Anti-restorationists, Architects, and Archæologists," and "Albanions," as it appeareth in "Church Restoration Principles," according to Lord Grimthorpe.

This, from Byron (*Don Juan*, lviii. canto xvi.), may interest. It seems almost as if Lord Grimthorpe must have been in the poet's eye when he wrote:

"There was a modern Goth—I mean a Gothic,
Bricklayer of Babel, call'd an architect;
Brought to survey these grey walls, which though so thick
Might have from time acquired some slight defect;
Who, after rummaging the Abbey through thick
And thin, produced a plan whereby to erect
New buildings of correctest conformation,
And throw down old, which he call'd *restoration*."

GOTH.

BOOKS RECEIVED.

The History of Art in Scotland, by ROBERT BRYDALL (Edinburgh and London: William Blackwood and Sons).—The author, the master of the St. George's Art School, Glasgow, has in this volume reproduced, with additions, a series of lectures on the origin and progress of Scottish art. In some seventeen chapters Mr. Brydall has traced the history of art in Celtic days, and from the 13th century to the present time; not only painting, but engraving, architecture, and sculpture are included in the survey. The work is brought well down to date, the provisions of the new Charter now being applied for by the Royal Scottish Academy being given. A series of biographical sketches of Raeburn, Wilkie, Allan, the Nasmyths, David Roberts, and other 19th-century artists forms the second, and by no means the least, interesting portion of the book, which is well indexed, and contains a useful list of members of the R.S.A. from its foundation in 1838 to the end of last year.—*The History of Warwickshire*, by SAMUEL TIMMINS (London: Elliot Stock, 2, Paternoster-row) is the fifth of a series of excellent county histories, brought out in uniform binding and style at prices ranging from 6s. in cloth to a guinea and a half. Mr. Sam. Timmins' knowledge and love of the county are a guarantee for the accuracy of the record and the entertaining character of the story of Warwickshire. To the architect and

archæologist, no less than to the man of letters, "the heart of England," as Drayton calls it, possesses attractions outrivalled by no other district of England of equal extent, being rich in battlefields, castles and halls, mansions, abbeys, priories, colleges, and churches, and to all these Mr. Timmins will be found a well-read and interesting guide. Not only is the topography fully described, but biographical details of Warwickshire worthies, the legends, folk-lore and dialect, physiography and geology are descanted upon in a fresh and vigorous style, which renders the book one of interest and value to all to whom the names of Warwick and Kenilworth, Coventry and Stratford are "familiar as household words."

——*Holy Trinity, Minories*, by the Vicar (London: W. H. and L. Collingridge).—In this little pamphlet the Rev. Dr. Kinns has compiled the history of a church which, after escaping the Great Fire, was pulled down and rebuilt, with the exception of the north wall, in 1706. The church contains some Elizabethan and Carolean monuments, a carved-out reredos of the date of the reconstruction, and a complete series of registers from 1563 to the present time.

APPLIED MECHANICS FOR ARCHITECTURAL STUDENTS.—I.

1. THE term "Mechanics" is applied to the investigation of the laws of forces, and of the effects which forces produce upon bodies. These forces are generally represented by straight lines, which indicate the *directions* in which the forces act, and the *length* of the lines may be used to represent the *relative magnitude* of the forces. The *absolute magnitude* of a force is generally expressed either in pounds, hundred-weights, or tons avoirdupois. When a number of forces act upon a body either in the same or in different directions, and a single force can be found which exactly balances them; then another single force acting in the opposite direction to this last force, and equal thereto in magnitude, is called the *resultant* of the original number of forces, and its effect upon the body will be the same as that of the number of forces themselves, if substituted for them.

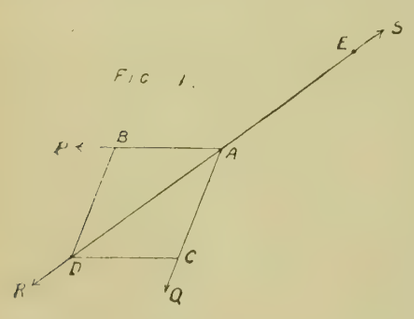
2. "Applied Mechanics" is the practical application of the laws of forces, as investigated by "Theoretical Mechanics," to all branches of construction, such as works of architecture, engineering, machinery, &c. In the present series of articles we shall confine ourselves to the consideration of those mechanical problems which are especially interesting to the architect, and which continually arise in the everyday working of his profession.

The first great principle upon which all mechanical investigation is based, and which is employed in the solution of all mechanical problems, is that which is known as

3.—THE PARALLELOGRAM OF FORCES.

Suppose the two forces P and Q to act at the same point A in a body, and to be represented in magnitude and direction by the lines A B, A C (Fig. 1); then if we draw B D parallel to A C,

FIG 1.



and C D parallel to A B, we form a parallelogram A B D C, whose diagonal A D will represent both in direction and magnitude the *resultant* (R) of the two forces P and Q. That is to say, the effect of the single force R will be the same as that of the two forces P and Q. If, then, we produce the diagonal A D in the direction A E, and make A E equal in length to A D, a force S, whose magnitude and direction is represented by the line A E, will balance the two forces P and Q; and the three forces, P, Q, and S are then said to be in equilibrium. This leads us to another important principle, which is known as

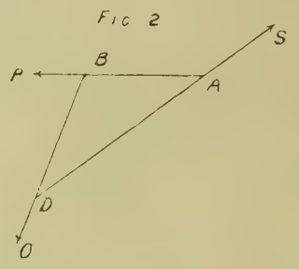
4. THE TRIANGLE OF FORCES.

If the three forces P, Q, and S are represented in direction and magnitude by the three sides of the triangle A B D (Fig. 2) taken in order; A B being the direction of P, B D that of Q, and D A that of S, these three forces will be in equilibrium at the point A where they are applied.

5. THE POLYGON OF FORCES

is an extension of the *triangle of forces* to any number of forces acting at one point; for if any

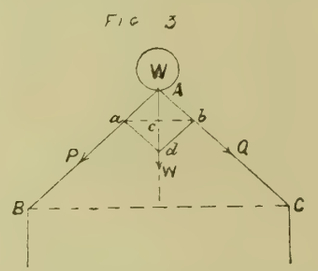
FIG 2



number of forces are represented in direction and magnitude by the sides of a polygon taken in order, they will be in equilibrium when applied at one point.

6. If the single force R (Fig. 1) acts at A, it can be *resolved* into two other forces acting in any other directions, as A B and A C; for if we put the line A D to represent the magnitude of this force and make A D the diagonal of a parallelogram A B D C, then the forces P and Q, which are represented by the sides A B and A C of the

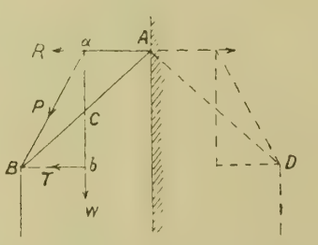
FIG 3



parallelogram, will produce the same effect on the point A as the original force R does. The forces P and Q are called the *components* of the force R, which is said to be *compounded* of the forces P and Q; or the force R is *resolved* into the forces P and Q. These propositions, therefore, constitute what is termed the *composition and resolution of forces*.

7. A familiar example to the architect of the foregoing theorems is seen in the pressure of a load W on the apex of two rafters A B, A C, supported at B and C (Fig. 3). Let the vertical line A *d* represent to any scale the load W, and draw the parallelogram A *a d b*, *a d* being parallel to A C

FIG 4



and *b d* parallel to A B. Then the length A *a*, will represent, on the same scale, the pressure P which is produced by W down the rafter A B, and A *b* will represent the pressure Q down the rafter A C. These forces P and Q can again be each resolved into two others at the feet B and C of the rafters—namely, one horizontal and tending to thrust out the supports at B and C, and the other vertical, which will act upon the supports as a compressive force. Join *a* and *b* by the line *a c b*, then *c a* will be, on the above scale, the outward or horizontal pressure at B, and the horizontal pressure outwards at C. A *c* will represent the vertical pressure at B, and *c d* the at C. If, therefore, there is a tie-rod pla horizontally across from B to C, the line *c a c b* will represent the tension to which it is su jected by the thrust of the rafters at B and C.

8. The ordinary "lean-to" roof affords a go example of the application of the "Triangle Forces." Suppose A B (Fig. 4) to repres a rafter supported on the wall at B, and leani against another wall at A. As the load W the rafter may be considered as distributed ur formly over its entire length, the effect will the same if we suppose W to act vertically at t middle point, C, of the rafter. The pressure of t rafter at A produces an equal and opposite for acting perpendicularly to the wall at A, which called "reaction," and is indicated by the for R acting in the line A *a*. The third force is t pressure upon the wall at B; and since t directions of the three forces must pass throu one point in order that they may be in equilibriur it follows that the three forces must meet at and the line *a* B will therefore represent t direction of the pressure P on B. If we dra B *b* parallel to A *a*, then the sides of the triang B *b a* will represent the relative magnitude of t three forces R, W, and P. Hence, if we tak the length *a b* to represent the load W, then will be represented by the length B *a*, while B will represent the horizontal thrust T caused b the rafter on the top of the wall at B.

If instead of the wall at A we have anothe rafter A D similar to A B but the reverse way then R will represent the *reaction* of the tw rafters at A; and if a tie-rod is placed across from B to D, then B *b* will represent the tensio T in the tie-rod.

The load W represents the *vertical* pressur sustained by the wall either at B or at D.

THE LATE MR. JOSEPH GORDON.

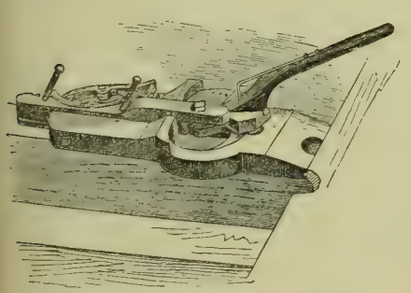
WE much regret to announce the very sudden death of Mr. Joseph Gordon who only in July last was appointed to th responsible post of engineer to the London County Council, at a salary of £1,500 a year Mr. Gordon was on his way from his residence in Stratbury Gardens, Hampstead, to his offices at Spring Gardens, in an omnibus, on Saturday morning, when he became insensible, and expired in a fit within a few minutes. At the inquest held on Monday, medical evidence was given to the effect that death resulted from syncope du to weakness of the heart, and a verdict wa returned accordingly. As we remarked, in announcing his appointment four months since, Mr. Gordon, although only fifty-two years of age, had already had a long and distinguished career as an engineer, and had had a wide range of experience, which would have well fitted him for the onerous duties he was called on to discharge in the Metropolis, and it is much to be lamented that he has been removed by death before he had the opportunity afforded of proving his powers to cope with the many engineering problems constantly arising in London. He was a man of ceaseless activity and energy, and threw his whole powers into any work he undertook, and in private life was widely esteemed and respected. Articled to the borough surveyor of Carlisle, he took part in the execution of the sewerage of that city, under Mr. (now Sir) Robert Rawlinson, and after some experience at Tynemouth, was appointed, in 1858, by Mr. Rawlinson, resident engineer of the sewage works at West Ham. From 1860 to 1866 Mr. Gordon was city surveyor of Carlisle, resigning that appointment to become acting engineer for the sewerage of Frankfort-on-the-Maine—a post which, seven years later, he exchanged for that of consulting engineer to the Frankfort Municipality. During the twenty years ending 1880 Mr. Gordon carried out, in whole or in part, sewerage schemes for Munich, Stuttgardt, Nuremberg, and many smaller towns in Germany and Austria, and drainage and waterworks in Dusseldorf, Linz, &c. In 1880, having declined the position of engineer of Bucharest, Mr. Gordon returned to England, and in November of that year was appointed borough surveyor of Leicester, where he nearly completed, as engineer-in-chief, the works in progress for the prevention of flooding in low-lying districts, at a cost of £260,000, and had prepared a scheme, now in course of execution, for re-sewering the town, at an ultimate

cost of a quarter of a million. In 1887-88 he served as President of the Association of Municipal and Sanitary Engineers and Surveyors—a body in which he had, from its formation, taken an active interest. Mr. Gordon had been a member of the Institution of Civil Engineers, London, since 1862, and was also a member of the Institution of German Engineers, and also of several Continental engineering and technical societies. He was twice married, and leaves a widow, who is now lying seriously ill, and several sons and daughters.

The funeral took place at Leicester Cemetery on Wednesday afternoon. The body was removed from the late residence of the deceased at Hampstead early in the morning, and forwarded by the 10.35 a.m. express leaving St. Pancras, being accompanied by several members of deceased's family and representatives of the London County Council. From Leicester station the cortége proceeded to St. Peter's Church, where a procession was formed at the south entrance, led by the Rev. F. W. Robinson, vicar, and the curate, followed by the surpliced choir, which had been strongly augmented for the occasion. The service throughout was fully choral. Eleven carriages followed in the procession to the grave, where are deposited the remains of Mr. Gordon's first wife, who died in May 1885. A large concourse assembled at the grave, including the Mayor and members of the Corporation of Leicester.

DIX'S PATENT FLOOR JACK.

THE floor jack represented in the accompanying illustration is designed to facilitate the laying of floors and ceilings, and is so constructed that the boards may be quickly jacked up and readily released when desired. The device, which has been patented in the U. S. by Mr. J. Dix, of Abbotsford, Wisconsin, consists of two parts or sections. The central section is secured firmly to the beam by nails or spikes, and the outer section slides upon the inner section. The latter is essentially rectangular in shape, and is provided at its outer end with an



inclined bearing face having a grooved edge, which fits into the tongue of the flooring, and a cup-shaped recess at its centre to facilitate the driving of nails. This section is provided centrally with a T-shaped slot, which guides its movement along the fixed section. It is also provided near its centre with a cam-shaped rabbet for a purpose presently to be described. At the end of the sliding jack bar is pivoted a vertical roller, and a hook-shaped dog is pivoted at the end of the jack bar, in close proximity to this roller. This dog has a cylindrical outer surface, which bears against the walls of the rabbet, and which is actuated by the handle shown, so that when the handle is thrust in the direction of the floor to be laid the cam will bear against the side of the rabbet, and will force the sliding section against the flooring, holding them closely together while being nailed. The handle is provided with a spring which passes through it, and the end of which may be inserted in apertures in the cam rabbet for locking the same when desired. The outer end of the sliding section is provided with a pawl, which is forced by a spring against the extremity of the jack bar, which has a serrated edge, so that when the sliding section has been forced out as far as possible, it will be held in locked position by the pawl engaging the teeth of the jack bar. The spring represented on the top of the jack bar is used for retaining the spikes in position and preventing their falling out when the device is inverted when in use on the ceiling.

At the annual meeting of the Lancashire County Council the following three district surveyors of county roads and bridges were appointed at salaries of £200 each and the allowance of third-class railway and omnibus fare: Mr. T. W. Debney, Darlaston; Mr. W. H. Schofield, Atherton; and Mr. F. J. Wood, Blackpool.

Building Intelligence.

BALSALL HEATH.—New Board Schools erected by the King's Norton School Board at the junction of Sherbourne-road with Orchard-road were formally opened on Thursday, the 30th ult. The schools, which have been erected from designs by Mr. W. Hale, of Colmore-row, Birmingham, provide accommodation for 1,618 children, in four separate departments, and a cookery class. The rooms are arranged in two blocks of buildings of two stories each. Messrs. W. Sapcote and Sons, of Camden-street, Birmingham, have carried out the contract at a cost of £10,149, excluding desks and other movable school furniture. This sum, after deducting the amount expended on the reparation of two old dwelling-houses on the site, equals £6 4s. per head.

DARLINGTON.—The dedication and opening of the new chancel which has been added to St. Luke's Church, took place on the 6th inst. The additions, which provide 90 more seats, consist of a chancel, organ chamber, and commodious vestry, erected in a severe type of Early English. The walls, which are of great thickness, are faced externally with Tow Law blockers and Dunhouse dressed stone. Internally, the walls are lined with a moulded panelled dado, surmounted with moulded and embattled capping. Above this dado and up to the ceiling cornice the walls are plastered, finished rough—the plastering being broken at intervals by internal stone dressings of windows and arches. The ceiling is a lofty one, of woodwork, seven sided and formed into panels by moulded longitudinal and transverse ribs, springing from a moulded, carved, and embattled cornice. The chancel seating and reading desks, and all internal woodwork is of pitchpine. The floors are paved with encaustic tiles and Yorkshire stone on concrete foundations. The stonework has been done by Mr. S. Allanson, Darlington, and the woodwork by Mr. W. Franks. Messrs. Clark and Moscrop, of Darlington, were the architects.

GRIMSBY.—The new cemetery recently formed by the corporation of Grimsby was dedicated on Wednesday, October 25th. The buildings consist of two chapels, connected with arch and tower and spire 80ft. high, entrance lodge, waiting rooms, lavatories, mortuary, and entrance gates. The chapels are of thin bricks and Ancaster stone dressings, and are richly carved; the lodge and other buildings half-timbered in style, and all are covered with green Westmoreland slates. The works have been carried out at a cost of £4,000, by J. W. Thompson and Sons, of Louth, from the designs and under the superintendence of Mr. E. W. Farebrother, F.R.I.B.A., Grimsby.

LEAMINGTON.—The parish church was re-opened on the 2nd inst., after having undergone alterations and improvements, from designs by Sir Arthur Blomfield, R.A. This first stage of the work of restoring and completing the edifice consists of the rearrangement of the choir of the church, together with the erection of a new chancel screen, the building of a new choir vestry, the ornamentation of the side chapel, and the fixing of a new heating apparatus. The lower part of the chancel screen is executed in veined alabaster, carved, moulded, and polished, and surmounted with wrought iron ornamental work, painted and gilded with pure gold leaf, with gates to match. The floor of the chancel is relaid with encaustic tiles, made at the Jackfield Quarries, near Iron Bridge. The steps leading to the chancel are of polished black Devonshire marble, and two new moulded stone doorways have been cut through the side walls of chancel to form entrances to the north and south transepts, with wrought-iron gates fixed in them. In the choir, stalls, prayer-desk, and seats of solid English oak, and of rich design, standing upon oak floors, have been substituted for the old ones, and these seats now stand back in their proper situations, and are three in number on each side. The work of decoration in the side chapel has been executed by Messrs. Cox, Buckley, and Co., of 29, Southampton-street, Strand, London. The builder and contractor was Mr. J. Thompson, of Peterborough, at whose works the alabaster and oak fittings were prepared; the iron screen work was executed at the Midland Art Metal Works, Coventry, and Messrs. Bloomfield and Son, of George-street, Leamington, rearranged the seats, doors, &c.

LONDON COUNTY COUNCIL.—At Tuesday's meeting of the Council Lord Rosebery read a letter from Sir Sydney Waterlow, offering to present to the Council his estate, 29 acres in extent, on the southern slope of Highgate-hill, to be used as a public park. The gift was accompanied by a further offer of £6,000 to redeem the leasehold interests in a portion of the land. At the same meeting the Asylums Committee reported that they had reconsidered the tenders for the extension of the lunatic asylum at Cane-hill, and had come to the conclusion that Messrs. Peto Brothers' tender be accepted. It was found, however, that, owing to an increase in the price of iron and steel, Messrs. Peto required £1,400 more than the £82,447, their original tender. It was resolved, on a division, by 50 to 45 votes, that the report of the Committee be referred back, with a recommendation that the amended tender of Messrs. Peto be accepted. The recommendation of the Committee that the contract with Mr. E. Gabbutt for the erection of the superstructure of the asylum at Claybury should be accepted was agreed to.

THORNBURY.—Services in connection with the completion of the restoration of the tower of Thornbury parish church were held on Friday. The tower is 130ft. high to the top of the pinnacles, which are engraved in Parker's "Glossary of Architecture" as a specimen of work of the date *circa* 1540. The resemblance it bears to the tower of Gloucester Cathedral (began c. 1450) that of St. Stephen's, Bristol (c. 1470), and to that of Dundry has often been remarked. The pinnacles and battlements have for years past been in a very crumbling condition, and have been kept together by iron cramps and long iron rods, which had with age corroded and expanded so as to materially injure the solid masonry, rendering it also unstable. Messrs. Waller and Son, architects, of Gloucester, reported that all the pinnacles and parapets would have to be taken down and reset; the lead and wooden roof of the tower required extensive reconstruction, the bell frame bracing and strengthening, and that a lightning conductor should be fixed. Under the direction of the architects these works have been done under the supervision of Mr. William Wiggall, the clerk of the works. The pinnacles and battlements have been taken down and rebuilt from the lead roof; the old stones have been replaced where possible, and the old work executed on the old lines. The bell frames have been completely set in order and braced, and the roof relaid. The west window of the south aisle has been re-glazed. The amount expended has been over £800.

CHIPS.

Mr. Alfred Beaumont has been appointed surveyor for the East Riding, at a salary of £180 a year.

The new church of St. Leonard, Peel-road, Bootle, was opened by the Bishop of Liverpool on Friday. The church is situated near the northern boundary of the borough, in a rapidly extending district. Mr. Samuel Webster, of Bootle, was the contractor, and Mr. G. Bradbury, of Liverpool, was the architect.

The High School for girls in Wells city having outgrown the accommodation with which it started, the committee acquired the old grammar school-room over the cloisters at the rear of the present premises, and this has been restored, from designs by Mr. Hippisley, and made into a light and capacious schoolroom, which has been connected with the schoolhouse by a covered way. The schoolroom has just been formally opened.

On Tuesday evening, just after the guests at the mayoral banquet at Welshpool had taken their seats, Councillor Robert Hurst, who was elected a member of the town council on the 1st inst., fell down in a fit, and died. The deceased was formerly borough surveyor, and was in good practice as architect and surveyor. Mr. Hurst leaves a widow and two children.

The Strand Theatre is being redecorated and re-upholstered by Messrs. Campbell, Smith, and Co., the same remaining open to the public during the progress of the work.

An inquiry was held at King's Heath, near Birmingham, on Friday, before Col. Ducat, an inspector to the Local Government Board, as to an application from the King's Norton rural authority for sanction to borrow £5,330 for sewerage works and street improvements at King's Norton and Northfield. The scheme has been prepared by Mr. Godfrey, surveyor to the authority.

Engineering Notes.

Institution of Civil Engineers.—The opening meeting of the session took place on Tuesday, when the new President, Sir John Coode, delivered his inaugural address. He chiefly dealt with the British Colonies as fields for the employment of the civil engineer. He referred to the construction of harbours, docks, and works in connection with navigable rivers. With regard to Canada, he commented on the importance of the St. Lawrence Canal System, which, in conjunction with the great lakes, extended for 2,260 miles. Alluding to the West Indies, he pointed out that the harbour of Castries, St. Lucia, would be one of the best in that part of the world. Having referred to the railways, harbours, and breakwater in the Cape Colony, and to the engineering works in Ceylon, New Zealand, Tasmania, and other colonial districts, the President concluded by expressing the opinion that, notwithstanding the great advances already made, no limit to engineering achievements could be prescribed, and that there would be a continuous progress in the science and practice of every branch of labour in the field appertaining to the civil engineer.

Wharfe Navigation.—A report has been made by Mr. Fowler, C.E., of York, as to the improvements which may be carried out in the navigation of this river. The length of the river from Tadcaster Weir to Wharfe mouth is nine miles, and its minimum width at low water 35ft. The river consists of a series of deep pools and shoals, the latter acting as natural weirs. But to effect a permanent navigable depth Mr. Fowler recommends the construction of a weir below Ulleskelf, by means of which the present summer level above the weir could be raised 2ft. This would not interfere with the drainage of the land, and the only dredging necessary between the weir and Tadcaster would be the removal of the tops of the shoals; the depth below the weir would be maintainable by dredging at a moderate cost. There could be no increased liability of flooding, as the weir would be so constructed as to be able to be lowered level with the river bed in a few minutes. The estimate for the necessary works is £3,666, and the probable cost of maintaining the river £220. The time occupied in constructing the weir would be about six months. It is proposed to form a company to carry out the proposed improvements, and to procure a provisional order or an Act of Parliament.

CHIPS.

At a meeting of the Driffield Rural Sanitary Authority on Friday, an amended and larger scheme of drainage for the village of Kilkhain, prepared by Mr. G. Bohn, C.E., of Hull, was adopted, and it was resolved to apply for a loan of £1,500 to carry it out.

A man named Hatfield, who was injured through his pony taking fright at a steam-roller on the Victoria Embankment, has recovered £200 damages from Messrs. Mowlem and Co., the contractors, who were employed in mending the road when the accident occurred.

St. Peter's Church schools at Hereford were re-opened last week after addition of classrooms, alteration, and renovation, at a cost of over £600. Mr. T. Nicholson, of Hereford, was the architect, and Messrs. Bevan and Hodges, of that city, were the contractors.

Messrs. Doulton and Co., sanitary apparatus manufacturers and potters, who about a year ago built large works at Hawkhead, Paisley, were granted power of Paisley Dean of Guild Court on Friday to make extensive additions. It is stated that at the present time the works only occupy one-eighth of the space they will cover when completed.

Alderman Thomas Nelson, builder, was re-elected Mayor of Stockton-on-Tees on Saturday, and Alderman John Lucas, brick manufacturer, was elected Mayor of Gateshead.

A large chiming clock has just been erected at Warmington Church, Warwickshire, by John Smith and Sons, Midland Clock Works, Derby. It is fitted with all the latest improvements, and guaranteed to maintain true time with less variation than a quarter of a minute a month.

The fine new technical school which has been erected at Stockport at a cost of £10,000 was formally opened on Tuesday afternoon by the mayoress.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Birmingham Architectural Association.—The annual conversazione in connection with the above was held last Wednesday evening, when the members and their guests to the number of over 300, met at the Edgbaston Assembly Rooms. The guests were received in the drawing-room by Mr. T. Naden, president; Mr. W. Hawley Lloyd, vice-president; and other members. A short instrumental concert followed the reception, and was succeeded in its turn by dancing, which was continued into the early hours of the morning. In the drawing-room a collection of drawings and works of art had been arranged, lent by Messrs. Herbert Railton, Aston Webb, Phené Spiers, Gerald C. Horsley, W. T. N. Millard, Ernest George, W. N. Gething, and J. S. Paul; together with art metal-work by Messrs. Hart, Son, Peard, and Co.; and the pottery sent by Sir Henry Doulton, from the Lambeth and Burslem Potteries. Considerable interest was also attached to the fine sets of drawings—the work of students of the Association—the measured drawing of ancient buildings being especially good; and in connection with the students' work it may be mentioned that one of the junior members has this year carried off a prize in competition with his professional brethren of the A A., London.

Manchester Architectural Association.—The first ordinary meeting of this association was held on Tuesday week, when the president (Mr. J. H. Woodhouse, M.S.A.) delivered the opening address of the session. He drew attention to the list of papers to be read during the session, some of which are by architects from London and Birmingham, and suggested that at these meetings it might be advisable to allow members to introduce non-professional friends. Referring to competitions, he said it was a mistake to compete, unless there was a professional assessor, or assessors, and he only wished they were so unanimous a body that they could compel all promoters of competitions to agree on this point. He advocated the taking out of quantities by the architect, but insisted on the same being done with every care, and made as explanatory as possible, leaving no doubt in the mind of the builder as to his (the architect's) exact meaning and intention. He also referred to the affiliation with the Royal Institute of British Architects, and to the communications received from the Manchester Society of Architects, advocating the formation of one society instead of two, as at present. A hearty vote of thanks to the president for his address was moved by Mr. A. H. Davies-Colley, seconded by Mr. Chadwick, and supported by Messrs. Hodgson, Mee, and Potts, and carried unanimously. Thirteen new members were nominated, and a number of donations to the library were announced.

Sheffield Society of Architects and Surveyors.—A meeting of the above society was held last Tuesday night at the School of Art. Mr. C. J. Innocent (vice-president) occupied the chair. Mr. J. Lancashire was unanimously elected a student of the society, and Mr. W. Teather was also nominated by the chairman. Mr. W. H. Lancashire read a paper on "Engineering Surveying for Railways and Waterworks." He observed that the question of cost would not enter into his paper so much as his own experience of from 20 to 25 years of the work required from the surveyor and engineer, in Parliamentary practice, to comply with Standing Orders. In railway practice nowadays the surveying work was done by the staff of the company's own engineer, Ordnance Survey and town or district large-scale maps being utilised in the preliminary work, and the Ordnance levels in laying out contours. Mr. Lancashire went on to describe the details of the finished surveys and levelling, and insisted upon the importance of checking levels taken. 1 in a 100 was considered a dangerous gradient 25 years ago: whilst with modern types of engines and rolling stock it was thought little of.

The Surveyors' Institute.—The session of this institute was opened on Monday night by an address from the president, Mr. E. P. Squarey, on different phases of the land question. The president dealt with the circumstances which had adversely affected the value of agricultural land, and pointed with satisfaction to various facts which went to show that the tendency was towards higher prices. It was interesting to reflect upon the changes in the commercial and political aspects of land as an investment, the alteration in sentiment in relation to land as a possession, and the generally modified conditions which, since 1870, had arisen to affect the disposition to buy or sell land. The political agitation in relation to land and its tenure suggested possibilities as to how far the rights of property, as recognised in the past, might be dealt with or moderated in the future. The extreme views of the land nationalists and other kindred movements had not found favour with the great common-sense mind of the English people, and it was scarcely likely that these socialistic, confiscating tendencies would largely commend themselves; but their very existence was an element affecting the disposition to invest in a security which, of all others, was most coveted by those who had it not, and most open to attack. He proceeded to deal with the legislation of the last Session in regard to land, and stated that, with respect to the Board of Agriculture Act, the institute, to provide for the future education in forestry, to which a status had been given, had prepared a complete system of special examination on the subject, as well as in sanitary science, land surveying, and in levelling. The Arbitration Act would materially strengthen the hands of arbitrators. On the motion of Mr. W. Matthews, of Birmingham, seconded by Mr. Meadows White, Q.C., thanks were voted to the president for his address.

COMPETITIONS.

Gartloch.—At a recent meeting of the city of Glasgow Board of Lunacy, the plans of Messrs. John Thomson and R. D. Sandilands, 121, West Regent-street, were accepted for the construction of a new asylum at Gartloch. The board invited eight firms of architects in the city to submit designs for an asylum to accommodate 500 patients, and six of these complied with the request. After careful examination of the plans sent, the board adjudged those by Messrs. Thomson and Sandilands the most suitable, and they were appointed architects of the buildings, which it is expected will cost about £70,000. Messrs. H. and D. Barclay, Wellington-street, were awarded a premium of £100, and Mr. H. F. Clifford, St. Vincent-street, £50; while the other three firms got £25 each. The Gartloch estate, which belongs to the board, extends to about 350 acres, and the buildings are to be erected on a pretty site near to the loch, which is beautifully shaded by trees.

Glasgow.—The "Alexander Thomson" Memorial.—At a meeting of the Thomson trustees, held on Friday, Mr. John Gordon, president of the Glasgow Institute of Architects, in the chair, it was resolved that the next competition for the travelling studentship shall be for the best original design of a public hall to accommodate 1,000 persons (seated), with suitable committee rooms, the design to be in the Early Classic style, and for an isolated site. The award is to be made on September 15, 1890, and the prize is £60.

Inverness. — Messrs. Ross and Macbeth, Queensgate Chambers, Inverness, have been selected as architects for the new Free North Church in that town, which is to be built at a cost of about £7,000. Seven local architects engaged in the competition. The plan originally selected and recommended by a sub-committee was one submitted by Mr. Cameron, of Church-street, Inverness; but after a long and lively discussion the general committee, by 82 votes to 32, adopted Messrs. Ross and Macbeth's design.

The Bishop of Lincoln reopened Clixby Church on the 29th ult. After being closed for about 20 years it had become almost a ruin, the walls were crumbling, the windows were demolished, and the whole fabric and churchyard presented a desolate and forlorn appearance. The work has been carried out by tradesmen of Caistor under the direction of Mr. Hodgson Fowler, F.S.A., who furnished plans for the restoration of the nave, while the Ecclesiastical Commissioners have been responsible for the small chancel, which has been restored from a plan by Mr. Ewan Christian, their architect, this part of the work being carried out by Mr. J. Button, of Caistor, at a cost of about £100.

Mr. Andrew Young has resigned his post of surveyor to the School Board for London, having been appointed valuer to the London County Council at a salary of £1,000 a-year.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

"BUILDING NEWS" DESIGNING CLUB.

DONOVAN, Ayr. (Yes, all drawings are returned in due course when done with.)—APHORISM, Luton. (Look at the rules; see BUILDING NEWS Oct 25th last, when the first subjects were given.)—J. L. W. D., Truro. (The new subjects will be published in the last number of each month.)

RECEIVED.—C. and Co.—W. E. G.—A. W.—M. E. S.—N. and R.—J. W. and Co.

Correspondence.

THE OLD HALL, GAINSBOROUGH.

To the Editor of the BUILDING NEWS.

SIR,—Referring to your illustration in number for Nov. 1st of the back of a grate at the Old Hall, Gainsborough, wherein you say the arms are those of an unknown family, allow me to submit the following particulars, which may give a clue to the family:

So far as outlines go, the coat is of the family of Saunderson, at one time of Grimesthorp, near Sheffield, and if tinctured would probably read: Paly of six ar, and az, on a bend sable 3 annulets or.

Curious to say, the back has T. S. upon it and 1619, for about this period a T. Saunderson was living. The Saundersons were a noted family in and near Sheffield in the 16th and 17 centuries. It will be seen that the arms I quote agree with your drawing, except only the differencing by a crescent.—I am, &c.,

ARCHIBALD D. DAWNAY, A.M.Inst.C.E.

Nov. 12.

MARKING HEIGHTS OF ROOMS ON PLANS.

SIR,—With reference to "Amethyst's" letter of the 31st ult., I should like to say I have adopted the simple plan of marking the heights of rooms on plans by putting the figures in a circle. I believe this to be not an unusual plan.—I am, &c.,

Nov. 8. RUBY.

HANLEY S.A. BARRACKS.

SIR,—As the paragraph in your last issue relating to the above has created some misapprehension, I shall be glad if you will allow me to state:—

1. That the said barracks were not erected for the Salvation Army.

2. A short lease of the property has only been secured by them.

3. The altering of the staircases, adapting and fitting up for Salvation Army purposes, was done under the direction of my own staff.—I am, &c.,

J. W. DUNFORD,
Architect to the Salvation Army.
101, Queen Victoria-street, E.C.

Intercommunication.

QUESTIONS.

[10147.]—**Form of Agreement.**—Will some experienced reader kindly tell me a good form of agreement for use in engaging a "builder's general foreman," to include a precautionary clause legally binding him not to set up in business himself, or to take another engagement, within a certain distance? And are printed forms to that effect obtainable?—ONCE BITTEN.

[10148.]—**Beams, Floors, and Joists.**—Will someone kindly answer the following, showing the working? (1) A beam supported at each end, and resting on a column in the centre, is calculated to carry 11 tons equally distributed over it. What weight will the same beam carry if the column is removed? (2) A floor, 30ft. by 20ft., has to carry a weight of 2½cwt. to the foot. The joists run the short way of the room, resting on binders 6ft. 6in. apart (centre to centre), carried by girders 10ft. apart. Calculate the scantling of the binders from the formula—

$$W = \frac{c\,b\,d^2}{L}$$

Where W = breaking weight in cwts. (distributed)
B = breadth of binder in inches
d = depth of binder in inches
l = span of binder in feet
c = 8 for breaking weight (distributed).

N.B.—Take ⅓ of breaking weight for safe weight. (3) The binders in the foregoing question rest on pairs of I wrought iron joists 10ft. apart (centre to centre). Calculate the section of these joists from the formula—

$$\frac{W \times L}{40\,d} = a$$

Where W = weight to be carried in tons
L = span in feet
d = depth in feet (not inches)
a = area of bottom flange.

Give figured sketch of pair of rolled joists (to scale).—BEGINNER.

[10149.]—**Crossings.**—I notice in a specification an item of "Dressed half-sovereign pitcher paving as crossings." Can any of your readers tell me the size of these?—ALENGON.

[10150.]—**Large Tracery Windows,**—I should be glad to learn what is considered by experienced men to be the best method of laying down *large* tracery windows, full size, on zinc, for the masons to work from. If the tracery is drawn on a large boarded surface, there is such a difficulty in transferring the lines on to the zinc, as the zinc covers and hides the lines on the board. Information on this point will be much esteemed by—TRACERY.

[10151.]—**Waste Pipes of Baths.**—Is any chemical preparation made for cleansing waste pipes from baths, &c.? I find such pipes always become offensive from soap, &c.—C. M.

REPLIES.

[10129.]—**Spire.**—"J. E. S." has ensconced himself in Doubting Castle, and is troubled about many things; but, as he is willing to learn, his case is hopeful. I found the 1843 Vol. of the *Builder*, but, to my surprise, discovered that the particular number referred to was lacking. Whether this indicates favour or disfavour of the Cockerell communication I know not, nor does it matter, for the opinions of Messrs. Gwilt, Turner, and Cockerell in Gothic practice I hold to be not worth a rush. It is absurd for men of Classical proclivities to lay down rules for Gothic art. The styles are as opposed as oil and water, and men trained to the one will not, I hold, succeed in the other. The only absolute authority in modern times was Pugin. He did not recognise the fad of entasis. In his "True Principles" he gives an illustration of a stone *straight* lined spire in contrast to the bulbous Dutch forms, and says, with reference to spires, &c., "We can never successfully deviate one tittle from the spirit and principles of Pointed architecture." The highest living authority is, without doubt, Mr. Butterfield. His spire to All Saints', Margaret-street, is the best specimen of timber spire of the present day, or, perhaps, any past time. I commend it to the notice of "J. E. S." He will find its lines *straight*. Those would-be eclectic architects who swell their spires are untrue to the principles they profess, for assuredly no swelling should be visible. The inventors of the system only curved their lines in order to make them appear *straight*. With reference to the proposed lead covering, I must again enunciate "Don't." No one with knowledge or reflection would use lead now. Old spires so covered have suffered much, the metal absorbing the solar heat, and so twisting the timbers. The Chesterfield spire is an extreme example, distorted and ridiculous. Small village spires are appropriately clothed in tile or oak shingle; but a spire of size and dignity should be covered with slate. Mr. Butterfield has at All Saints' varied the slate with lead bands. There should be no eaves gutter, and, of course, no gargoyles; but there should be a projection at top of tower at junction with spire, or the appearance will be mean. Engineers are not satisfied unless they tie down their roofs, and some architects do this with spires; but I can only say that the old spires were not so treated, and prove that it was not needed.—M.

[10139.]—**Ventilator to W.C.**—The down-blow is the result of the superior density of the air outside. It is a common mistake in attempted ventilation to only put an opening as exit which proves to be an inlet. You must have another opening near floor-level, also from outside.—M.

[10140.]—**Spire—Entasis.**—"J. E. S." will find methods of drawing "entasis" in the BUILDING NEWS for July 10, 1885, p. 41, which will apply either to columns or spires. The amount of entasis should be very small—not exceeding 1in. in 20ft., so as to be scarcely visible. In the chapel at Halifax mentioned by "Tolop," the entasis is very much exaggerated, and the spire completely spoilt.—E. W. T.

[10142.]—**High Chimney-Shaft to Boilers.**—In answer to "Teachable," the shaft at Rainham, though used as a smoke flue, is principally designed for carrying off odours arising from the manufacture of fish and blood manures. It is situate about 200ft. from the boilers, and as the flue surfaces are exposed and utilised for drying, comparatively little *heat* ever reaches the shaft.—W. SECKHAM WITHERINGTON.

[10143.]—**R.I.B.A. Exams.**—The best books to study, in my opinion, are (1) for Sanitary Science, Denton's "House Sanitation" and Hellyer's "Plumber"; and for Shoring, Stock's "Shoring and Underfitting." The questions on the strength of materials are so simple that any schoolboy could answer them. (2) Upon Materials of Construction the best works are undoubtedly those issued by Rivington, Seddon's "Builders' Work," and Mitchell's "Building Construction." I issue test-papers myself, as "Z." can see by referring to your advertisements under the heading Situations Vacant.—G. A. T. MIDDLETON.

[10145.]—**Public Buildings.**—No price can be given for general use. In cubing it is absolutely necessary that the example taken as guide should exactly correspond with the one to be estimated. London public buildings vary greatly in cost, and London prices won't do for other places. Consult an intelligent builder. Fourteen-pence may be about the figure.—M.

CHIPS.

New buildings have been erected at West Kirby, consisting of a chapel to seat 800 persons, with minister's vestry at the rear. The school premises consist of an assembly-room and four classrooms. The whole will be built of local red sandstone. The contract for the school-buildings is let to Mr. Wm. Christian, of West Kirby, for £938. The architect is Mr. John Wills, of Derby.

The Conway Memorial Hall, which has been built in close proximity to Holy Trinity Church, Old Brompton, at a cost of £900, was opened on Tuesday week. The building is 74ft. by 24ft., and has been built by Mr. W. C. Snow, of New Brompton, from the plans of Mr. W. Tozer, of Old Brompton.

At the monthly meeting of the school board for Leith, held on Tuesday, a discussion arose on a proposition that Mr. George Craig be appointed architect of the school to be erected at Craighall-road. To this an amendment was moved that competitive designs be invited from all architects in the burgh, and this was carried by a narrow majority.

Saundersfoot is to have a new Wesleyan chapel, to take the place of the present unsuitable building. Plans have been submitted by Mr. John Wills, of Derby, and approved.

Mr. John Corbett, M.P. for Droitwich, laid on Friday the foundation stone of a sea-wall and esplanade on his Welsh estate at Towyn, on the Merioneth coast, which are to be constructed by him at a cost of £4,000, and to be presented, with a recreation ground, to the public. Mr. Corbett also cut the first sod of the water supply and sewerage works which the local board are about to carry out at a cost of about £6,000. The works have been designed by Mr. Collingwood, of Rhyl, and the contracts taken by Mr. Bugbird, of Carnarvon, and Mr. Morris James, of Towyn.

St. Luke's day-schools in Markham-street, Chelsea, are being rebuilt on the old site and enlarged. The new schools are Queen Anne in style, and faced with red brickwork. Mr. Holt, of Croydon, is the contractor.

At the Carlisle Consistory Court on Wednesday a faculty was granted to erect two stained-glass windows in St. Mary's Church, Ambleside, in memory of the late Right Hon. W. E. Forster and Mr. Matthew Arnold. The windows have been designed by Mr. Henry Holiday, of London.

The vestry of St. Giles, Camberwell, agreed on Wednesday to contribute £6,000 towards the purchase of Brockwell Park as a public park for South London, subject to Parliamentary powers being obtained for this purpose. The centre of this beautiful park, consisting of 95 acres, has been offered for the sum of £122,000, and towards this there only now remains £2,500 wanting to complete the purchase money.

The centenary memorial to John Howard, the philanthropist, will take the form of a statue in bronze.

LEGAL INTELLIGENCE.

In re Waddington.—The receiving order under this failure was made in January last, and the bankrupt applied on Tuesday for an order of discharge. He had traded as a builder in Pancras-lane, and he ascribed his difficulties to losses on contracts and general business. His liabilities were returned at £4,202, and the trustee certified that the assets had realised £325. The bankrupt commenced business about the year 1870 as a builder at Barrow-in-Furness, and in 1878 he effected an arrangement with his creditors. He came to London in 1881 as a foreman workman, and in 1882, without capital, he took over a contract for the completion of some houses upon which he had been working under a builder who had absconded. In the following year the bankrupt filed a petition for liquidation at Greenwich, his liabilities amounting to about £1,200, but no dividend was paid to the creditors. Later, in 1883, being still without capital of his own, he entered into a contract to build houses at Sydenham, the freeholder financing him, and he was subsequently engaged in between 100 and 150 other contracts. In August, 1888, his stock and premises were destroyed by fire, £1,950 being paid to him by an insurance company, which he expended in reinstating the property. The Official Receiver and a creditor opposed. Mr. Registrar Linklater, in giving judgment, came to the conclusion that the bankrupt had engaged in rash and hazardous speculations. He suspended the order of discharge for three years.

The Restoration of St. Alban's Abbey.—On Saturday, at the Royal Courts of Justice, Mr. Jeune, Q.C., Chancellor of the Diocese of St. Alban's, heard a petition presented by Mr. Henry Hucks Gibbs, Aldenham House, Elstree, for a faculty to enable him to restore, repair, and refit the Lady Chapel of St. Alban's Abbey. Sir Walter Phillimore, Q.C. (Mr. C. A. Cripps with him), appeared on behalf of Mr. Gibbs; Lord Grimthorpe, the only opponent to the application, appeared in person. Among those present in Court were Mr. Gibbs and his son, the Rev. K. F. Gibbs, the Vicar of Aldenham, and the Ven. Archdeacon Lawrence. The petition stated that originally a faculty to restore the abbey was granted to a committee, who, however, were unable to carry out their work for want of funds. Lord Grimthorpe (then Sir Edmund Beckett, Q.C.) offered to take up the work at his own expense, and the offer was accepted. Mr. Gibbs, a few years since, undertook the restoration of the high altar screen, which is now almost completed. The petition now presented is for a faculty which would enable Mr. Gibbs to restore the Lady-chapel, which is in a very bad state of repair. Lord Grimthorpe opposes broadly on the ground that the faculty granted to him after taking up the work on the failure of the committee covers the whole fabric, while on the other side it is alleged that the portion which Mr. Gibbs asks to have control over for restoration purposes is not part of the cathedral, and consequently does not come within the terms of Lord Grimthorpe's faculty. Sir W. Phillimore read the whole of the correspondence which had passed between the rival restorers, the brusque, off-handed style of the one writer being in marked contrast to the courteous, yet firm tone adopted by his antagonist. The first witness called was Mr. Harry Hems, sculptor, Exeter, who has carried out the work of restoring the high altar screen under the direction of Sir Arthur Blomfield. Cross examined by Lord Grimthorpe, he stated the work which yet remains to be done on the screen. He had had no orders about the great cross. He thought the work at the screen would have cost Mr. Gibbs fully £10,000. Sir Arthur Blomfield was next called, and he gave evidence as to various structural works. He had no orders from Mr. Gibbs at present for more work at the abbey. It was arranged that the evidence on each side should be completed before the addresses of counsel, and Lord Grimthorpe was sworn. He was examined at considerable length by Sir W. Phillimore as to the part he had taken in regard to the work of restoring the various portions of the fabric, and he gave his interpretation of the controversial terms mentioned in former faculties. He claimed that the reredos was a matter which he could have restored under his faculty, and put statues in it. It might be a matter of discretion whether he would put in statues or not, but, as to the right to do it, he had no more doubt on the point than he had as to his right to restore the nave and fit it for service. He also claimed that he had power to put in a table under the reredos, the rector having removed the previous one. It was part of the necessary fittings. The Archdeacon of St. Alban's and the churchwardens wrote to him on the 18th ult., stating that they had observed with great surprise that his lordship had recently placed a table against the great screen in the cathedral without consulting them. Lord Grimthorpe, they believed, knew that Mr. Gibbs had already offered to the Bishop, Archdeacon, and churchwardens a table for the same purpose. They therefore could not accept his lordship's table, and asked him to remove it. Lord Grimthorpe's reply, dated November 5, stated that on his return home he found what he could only call an impertinent letter from the Archdeacon and churchwardens. They ought to have known that his faculty enabled him to restore and refit the cathedral for church service without limitation, and the whole letter of the Archdeacon and churchwardens showed that they considered the Communion-table in the presbytery part of the fittings. He therefore declined to remove it except under an order—which was inconceivable—of an ecclesiastical Court. At the close of Lord Grimthorpe's evidence Sir W. Phillimore proceeded to address the Court on the legal points involved. During the delivery of the address Lord Grimthorpe interposed with the request to the Chancellor to adjourn the hearing till another day, as the weakness of age made it impossible for him to sit so long as he used to do in his younger days. Mr. Gibbs at once readily assented to this course, and the further hearing of the case was adjourned till to-morrow (Saturday) at eleven a.m.

Re W. H. Gibbs.—Under the failure of W. H. Gibbs, builder and contractor, of West Kensington and Fulham, accounts have been furnished showing gross liabilities £608,403, of which, however, only £13,941 are unsecured, and a surplus in assets of £3,161. The securities held by creditors are stated to consist chiefly of mortgages on property in the West Kensington and Fulham districts, and which during the last few years have greatly depreciated in value.

Charge of Conspiracy against a Builder and his Foreman.—Henry Collin and John Kermode were charged, at the Liverpool Police-court on Friday, with conspiring to obtain, by false pretences, £20, the money of her Majesty's Commissioners of Works and Public Buildings, between May and September last. Mr. Paxton, who prosecuted, said that Collin was the son of Mr. Robert Wood Collin, who carried on business in Warrington as a builder, under the name of John Collin and Son, and Kermode was a foreman painter in the employ of the firm. On the 17th January a contract was entered into between Mr. Robert Wood Collin and the Commissioners of Public Works, by which the firm undertook to execute the ordinary work of repairs to buildings in the Liverpool district, under the charge of the Commissioners. It was a two years' contract. The prices to be paid to the workmen by the hour were set out in a schedule, and the firm undertook to do painters' work at 7½ per cent. less than 8d. per hour. In May the firm were called upon to do certain painting at the Liverpool Post Office. Weekly sheets of the men's time were sent in, and they were signed by the clerk of the works, after being examined by a man named Young, who was on the spot. The defendant, Collin, although not a partner, was not satisfied with the profit which the firm were making on the work by the hour, and he told Kermode to see that there was no loss sustained. After that, hours were put down to men who had not worked the time at all. The first case was that of a man named Clare, for whom 13½ hours were charged on a day when he was not at the work at all. The men's sheets were also altered by Kermode. The amount overcharged was altogether about £25, and the defendants had put in a statement showing the over-charges, and some credit items were claimed. Several witnesses were called to prove that more hours were charged than were worked. Mr. R. Wood Collin said he was not aware of the over-charges until October, and then he directed his son to make out a statement. His son looked after the work, and was paid £2 10s. a week. The hearing was adjourned.

CHIPS.

Mr. Frank Massie, F.S.I., who was last week elected borough surveyor of Wakefield, was articled to his profession at Bradford, and afterwards came to London to the office of Mr. H. Lovegrove (his brother-in-law), during which time he attended the lectures and classes of the Architectural Association and the lectures of Professor Roger Smith at University College. He has passed both the examinations of the Surveyors' Institution, and has been elected a Fellow of that body.

Copmanthorpe Church, near York, which has been undergoing restoration and enlargement, was reopened on Tuesday last. The church has had a new chancel, vestry, and organ-chamber added. The old tiles have been removed from the nave roof, and the whole recovered with Westmoreland slates. The floor of chancel has been laid with Broseley tiles, and the nave with solid wood-block flooring laid on pitch. The north wall of nave has been entirely rebuilt. The architect is Mr. C. H. Fowler, of Durham, and the whole of the work has been carried out by Mr. Wm. Denison, contractor, of Normanton.

Considerable alterations have been made to Springfield Mills, Morley, near Leeds, embracing the ventilation, which is now carried out on the Boyle system, the latest improved form of the patent self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

Our Office Table.

The London County Council have informed the local authorities of the metropolis that they propose to apply to Parliament next Session for powers—(1) To provide for periodical inspection of drains under houses by vestries and district boards, and for the execution of such works as may be found necessary; (2) to prevent the construction of basements below the level of sewers, except with the consent of the Council; and (3) to prevent buildings being erected in places where there are no sewers, except with the consent of the Council. Further, the Council ask for a copy of any by-laws bearing upon the subjects named. In reply the Sewers and Buildings Committee of the Islington Vestry have informed the County Council that with respect to Paragraph 1 of the letter, ample power is already given to vestries and district boards under Sections 82 and 85 of the Act 18th and 19th Vic. cap. 120, for the inspection of drains and the execution of necessary works connected therewith; and that as to Paragraphs 2 and 3, the objects sought by the Council are fully provided for under Sections 75 and 76 of the Act, save that the sole control of such works is vested in the local authority, and not the Council. The only by-laws vestries are empowered to make under the Metropolis Local Management Act, are limited to those necessary for the regulation of its meetings and of its committees, and to the appointment and control of officers.

The members of the Chelsea Vestry had a long, acrimonious discussion last week on the amended plans for the public free library prepared by Mr. J. M. Brydon. Mr. Hilton and Sir Charles Dilke explained that the quantities on which the lowest tender was based had been revised, Monk's Park Bath stone being substituted for Portland in the chief elevation, thus reducing the cost by £680; the number of bookshelves had been lessened from 100,000 volumes to 65,000, and galleries dispensed with, so that the cost would be reduced to £11,500. Mr. Jeffery, a builder, said when the Commissioners advertised for plans they made three conditions: that there should be room for so many people, shelves for so many books, and the cost should not exceed £7,500. Mr. Brydon, the selected architect, had not fulfilled one of these conditions. Yet the Commissioners had given him the £100 premium, and had selected his design. Some light was thrown on the tactics of competition promoters by Mr. Findon, who admitted with regard to the limit of price in the competition, it was true that the Commissioners fixed it at £7,500, but they did so because they knew that if they named the £10,000 which they really expected to have to spend, they would get plans that would cost at least £12,000 or £13,000. Eventually the modified design was sanctioned by the vestry. The selected design, by Mr. Brydon, was illustrated in our pages on the 7th June last.

The mosque at Woking, it appears, will not be finished in accordance with the drawing which we published in our issue of the 2nd August, so it does not altogether correspond with that drawing. There will be four minarets, not five, and one of them will be raised and enlarged, so as to enable the "Muezzin" to turn round with ease when calling to prayer. There will also be colonnades and another dome. Our artist's vivid delineation of the worshippers is, no doubt, derived from Eastern sources; but would not apply to the Mahommedan visitors to this country, who are dressed very much like Englishmen, nor to Mahommedans in any country, as their attitudes are not reverential, with the exception of one, who, however, looks like a Hindoo Coolie. The dome is towards the back of the building, and not in the centre, as shown in our drawing. The interior of the mosque under construction is as beautiful as the exterior. The most successful features of the mosque are the courtyard, with its reservoir for the ablutions of the faithful, the carved and perforated doors and screen, the elaborate pulpit, the little cupola over which, procured from India, takes to pieces, and shows how a dome can gracefully and gradually rise from a square, the shawl tapestry, the mosaic pavement, the reading-desk, quaint lamp, &c.

The long-contemplated restoration of the collegiate church of St. Saviour's, Southwark, so as to fit it for use as the future cathedral for South

London, is now being undertaken in earnest, and at the meeting held in the board-room at Borough Market on Tuesday, under the presidency of the Bishop of Rochester, promises amounting to upwards of £13,000 were announced, the sums offered varying from £5,000, given by Mr. J. Allan Rolls, to a postman's half-sovereign. It is proposed to expend about £35,000, and to occupy the next five years in carrying it out. A house-to-house visitation of the firms in Southwark is to be undertaken. The name of the architect to whom the work will be intrusted has not transpired.

An address on Art as Decoration was delivered by Professor Gerald Baldwin Brown, on Friday, in inaugurating the Fine Arts Class of the Association for the University Education of Women in Shandwick-place, Edinburgh. There was, he urged, a great interest of a literary kind attaching to the work of the decorative artist. It might be asked, Was not all art in general a decoration? In every work of art there must exist a decorative element, which must be pleasing to the sight in form or colour or both. Works of art were either essentially and avowedly decorative or decorative only in a modified sense. To the latter class belonged the great pictures of the Dutch school, and in general the best prized works of art. The cabinet picture had only appeared in Europe since the modern Renaissance, and the greatest triumphs of decorative art were won in Early Christian and mediæval times. A great revival took place in Italy in the 13th century, when it largely took the form of the decorative mural picture. It was pervaded throughout with a single spirit. Architecture itself was one of its forms. The designers of our Northern cathedrals were for the most part unknown, but those of Italy identified themselves with their work, and rested their fame upon it. The simple, rudimentary forms of decorative art had been in all countries a coronal of leaves or flowers. The original Greek temples were no more than a decoration of the sacred spot where the deity dwelt, and which the people had before worshipped in the open air; the primary idea was not that of use. There were hopeful signs for the future, for within the past two years the works of decorative art in our national competitions had shown a distinct advance in tastefulness and poetic character.

Prompt action is being taken by the residents of Richmond in bringing pressure to bear on the Commissioners of Woods and Forests to abandon their proposal to build upon the Crown lands lying below Richmond Park, known as Sudbrook Park. The park is a well-timbered tract of more than 100 acres, stretching from Petersham to Ham, and forms the fringe of level land lying between the high ground of Richmond Park and the road to Kingston. At a meeting of the Selborne Society, held at the "Star and Garter" on Wednesday night, a resolution was passed expressing the deepest regret at the action of the Commissioners of Woods and Forests in offering for building purposes part of Sudbrook Park, affecting the views from the Hill, and earnestly memorialising them to withdraw from the market land the sale of which would so seriously reduce the local attractions. The local authorities are to be stirred up to take action in the matter.

At the last meeting of the Douglas Town Commissioners a scheme, submitted by Mr. Thomas W. Cubbon, architect, of Birkenhead and Douglas, for the improvement of the junction of the Loch Promenade with the Harris Promenade was adopted. The schemes includes the filling-in of the angle between the two promenades and erecting thereon a new life-boat house, extensive waiting-room and lavatory accommodation for both ladies and gentlemen, and covered verandahs on the ground floor; whilst the upper floor will be used as an elevated promenade, in connection with which will be erected refreshment saloon, bandstand, and other conveniences. The old life-boat house will be removed and so permit of the widening of the Crescent-road, and improving the tramway curve which is at present so dangerous.

Professor Baldwin Brown, of Edinburgh University, lectured at Greenock on Friday night, under the auspices of the Greenock Philosophical Society, on the subject of "The Great Cathedrals and their Builders."

MEETINGS FOR THE ENSUING WEEK.

Monday.—Royal Institute of British Architects. 8 p.m.
Liverpool Architectural Society. "Structure of Sandstone as Affecting Architectural and Engineering Works," by T. Mellard Reade, President.

Tuesday.—Institution of Civil Engineers. "Water Tube Steam Boilers for Marine Engines," by J. I. Thornycroft. 8 p.m.
University College, Gower-street. Free Lecture on "Applied Art," No. 6, by H. Stannus. 5 p.m.
Manchester Architectural Association. "Old House Work," by F. M. Simpson, of London.
Glasgow Architectural Association Lecture by J. P. M'Gillivray, sculptor.

Wednesday.—Society of Arts. Opening address by the Duke of Abercorn, Chairman of Council. 8 p.m.

WATER SUPPLY AND SANITARY MATTERS.

Margate.—A system of main drainage is being carried out in Margate at a cost of £60,000, from plans by Mr. Baldwin Latham, C.E. The whole sewage of the town will be conveyed after collection through a tunnel constructed in the chalk cliff, about 60ft. deep, to the Foreness point, about two miles to the east of Margate Jetty, and there will discharge into the sea in deep water at the outer extremity of the Longnose Spit Rock. For the purposes of drainage, the area of the district is separated into two divisions, from the chief of which, comprising about four-fifths of the whole, the sewage with the rainfall flows direct by gravitation to the point of outfall. In the smaller division there is a separate system—*i.e.*, separation of the rainfall from the sewage is adopted, and the sewage is pumped so as to discharge itself into the gravitating outfall sewer. In this low-level division the rainfall is conducted direct to the sea by means of the present drains, and also additional ones which will be constructed. Part of the sewers of the low-level district are constructed in cast iron. The sewage is delivered into the sea across the Longnose Rock by a 30in. iron pipe in an excavated trench extending 550 yards from the base of the cliffs. At the edge of the cliff there are penstocks and tidal valve chambers with storm overflows, also ventilating shafts. The outfall sewer is egg-shape in section, and constructed of brick and concrete, and the invert lined with blue bricks. It is generally 4ft. 6in. high and 3ft. wide, interior measurement, the invert of which forms part of a section of an 18in. sewer. At the lower end, commencing at the Foreness point, for about one-third of a mile inland, it is constructed circular in section, and 7ft. 6in. interior diameter, and at a slightly lower level, for the purpose of storing the sewage during certain states of the tide. Messrs. B. Cooke and Co., of Battersea, are the contractors.

CHIPS.

Various alterations and additions are being carried out at the Clifton and County Club, Clifton, Bristol. A new card-room, about 60ft. by 30ft., of irregular shape, a new billiard-room and spacious dining-room, with kitchens and servants' sleeping and living apartments, are being added to the already extensive premises. The work is being carried out by Mr. A. J. Beaven, from the designs and under the superintendence of Mr. E. Henry Edwards, architect, of 5, Clare-street, Bristol, the architect to the club.

The memorial brass to the late Mr. George M. Chute, one of the proprietors of the Prince's Theatre, Bristol, has just been placed in the ancient church of St. Stephen in that city. It occupies a position immediately beneath the memorial window some months since erected to his memory, and has been executed by Mr. W. H. Baker, of Victoria-street, Bristol, from the design of Mr. E. Henry Edwards, architect, of 5, Clare-street, Bristol.

Messrs. Windell and Trollope are the architects engaged to remodel the premises existing on the site in Dean's-yard, purchased for the Church House, Westminster. These alterations, executed under the direction of Mr. Trollope, have been made to adapt the buildings for temporary use, pending the erection of the proposed premises, which will be carried out on a large and comprehensive scale.

The parish offices at Birmingham have just been redecorated by Messrs. Norton and Co., from designs of Mr. Ward, also of Birmingham.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

Aldenham, Herts.—For constructing a new road, for Mr. H. Hucks Gibbs:—
Lucas and Aird (accepted).

Arkley, near Barnet.—For building two cottages in Arkley-lane, near Barnet. Mr. H. A. Gregg, A.R.I.B.A., architect:—

James	£768 0 0
Miller	730 10 0
Worboys and Son	694 0 0

Ardrossan.—For carrying out works of drainage at North-crescent and Winton-street, for the borough commissioners:—
Inglis, G., Irvine (accepted)... ... £561 0 0

BAYSWATER.—For partial rebuilding and alterations at the Black Lion Tavern, Bayswater-road, W. Mr. R. A. Lewcock, 83, Bishopsgate-street Within, E.C., architect:

Davies, A.	£3,663 0 0
Kynoch and Co.	3,274 0 0
Lascelle	3,036 0 0
Hearn and Co	2,997 0 0
Todd, G. E.	2,989 0 0
Walker, J.	2,890 0 0
Balaam Bros.	2,854 0 0
Allen, J., and Sons (accepted)	2,850 0 0

BECKENHAM.—For billiard-room, Tamar, Wickham-road, Beckenham, under the direction of Mr. Parnacott, 156, Westminster Bridge-road:—

Kydd	£140 10 6
Artell	118 0 0
Kick (accepted)	101 0 0
Reed	99 0 0

BRISTOL.—For restoration of meter shop premises, Castle-green, Bristol. Mr. R. H. Leaker, architect. Quantities supplied by Messrs. Young and Brown:—

Cowlin	£4,231 0 0
Humphreys	4,104 10 0
Forse	3,920 10 0
Stephens, Bastow, & Co. (accepted)	3,803 0 0

All of Bristol.

BRISTOL.—For a branch factory and manager's house at Kingswood, for Messrs. R. W. Ashley and Sons, Wholesale Boot and Shoe Manufacturers. Mr. H. J. Jones, M.S.A., Bristol, architect:—

Eastabrook and Sons	£1,640 0 0
Godfrey, W., Kingswood	1,590 0 0
Hatherly, E. T.	1,563 0 0
Walters, E.	1,547 10 0
Church, W.	1,530 0 0
Humphreys, G.	1,475 0 0
Perrot, J.	1,407 0 0
Lewis, T. R. (accepted)	1,376 0 0

Rest of Bristol.

BRISTOL.—For pulling down old and building new warehouse and offices, Broadmead, for Messrs. H. Ashman and Co. Mr. H. J. Jones, M.S.A., Bristol, architect:—

	A.	B.
Church, W.	£2,540 0 0	£2,500 0 0
Wilkins, J., and Son	2,275 0 0	2,250 0 0
Bastow, J.	2,200 0 0	2,250 0 0
Cowlin and Son	2,189 0 0	2,189 0 0
Eastabrook and Sons	2,148 0 0	2,138 0 0
Krauss, A.	2,077 0 0	2,077 0 0
Humphries, G.	2,075 0 0	1,939 0 0
Walters, E.	2,074 11 10	1,995 0 0
Perkins, J.	1,995 0 0	1,995 0 0
Lewis, T. R.	2,000 0 0	1,965 0 0
Howell, E. and G.	1,960 0 0	1,904 0 0
Perrott, J. (accepted)	1,974 0 0	1,874 0 0

A.—Gross amount of tenders. B.—Nett ditto after allowance for old materials. All of Bristol.

BUSHBURY.—For the erection of electric lighting works, for the Electric Construction Co., Ltd. Mr. G. H. Stanger, architect and engineer:—

Lovatt, H., Wolverhampton (accepted)... £40,000

CARMARTHEN.—For altering stables, Quay, Carmarthen, for Messrs. G. I. Bland and Sons, Carmarthen. Mr. G. Morgan and Son, Carmarthen, architects:—

Jones, J. and D., Carmarthen ... £235 0 0

CARMARTHEN.—For dwelling-house, Priory-street, Carmarthen, for Mr. G. Treharne, Carmarthen. Messrs. G. Morgan and Son, Carmarthen, architects:—

Jones, J. and D., Carmarthen ... £302 0 0

CARMARTHEN.—For four cottages, Carmarthen, for Mr. H. Cadle. Messrs. G. Morgan and Son, Carmarthen, architects:—

Davies, W., and Thomas, T., Carmarthen £360.

CARMARTHEN.—For cottage, Tabernacle-terrace, Carmarthen, for Mrs. F. Harris. Messrs. G. Morgan and Son, Carmarthen, architect:—

Jones, J. and D., Carmarthen ... £162 0 0

CROMER.—For erection of town hall, for the Cromer Town Hall Co., Ltd. Mr. G. J. Skipper, F.R.I.B.A., Norwich, architect. Quantities by Mr. F. W. Skipper, surveyor:—

Downing, J.	£2,050 0 0
Chapman, W.	1,992 0 0
Burdell Bros.	1,900 0 0
Hawes, G. E.	1,900 0 0
Bray, J.	1,898 0 0
Lacey, H.	1,882 0 0
Mayes, R.	1,867 15 0
Blyth, J. H.	1,860 0 0
Cork and Beech	1,856 0 0
Eastoe, R.	1,828 0 0
Hipwell, S.	1,786 0 0
Newman, J.	1,733 15 0
Orfeur, J.	1,695 0 0
Young, J.	1,599 0 0
Chapman and Son, Norwich*	1,439 0 0

* Accepted.

ELGIN.—For hall, for the Elgin Auction Co. Mr. C. C. Doig, architect:—

(Accepted tenders.)
Mason:—Scott, W.
Carpenters:—Sellar and Leitch.
Slater:—Wilson, J.
Plumber:—Hunter, J.
Painter:—James, J.
All of Elgin.

FAREHAM.—For building a boiler house and cottage at the lunatic asylum, for the Hants County Council:—

Hall, T. P. (accepted) ... £1,202 0 0

FAREHAM.—For the supply of engines, boilers, &c., in connection with a new water supply to the lunatic asylum, for the Hants County Council:—

Waller, G., and Co. (accepted) ... £1,151 10 0

FULHAM.—For construction of roadway and pipe sewer in proposed Bishop King's-road, for the Trustees of Dr. Edwards and Bishop King's Charity. Mr. E. F. Roberts, 3, The Grove, Hammersmith, architect and surveyor:—

Foster and Dicksee	£998 0 0
Garton, J.	947 14 4
Ball, J.	870 0 0
Pizzey	833 10 0
Wilson, E.	811 0 0
Nash, G. H.	799 0 0
Dupont, F.	793 0 0
Garlick and Horton	711 0 0
Wheeler, W. H.	677 0 0
Coat, W. G.	675 0 0
Aldred, G.	669 0 0
Wildman, E.	653 0 0
Jackson, J.	650 0 0
Clements, J.	649 0 0
Adams, T.	643 14 0
Tomes and Wimpey	636 0 0
Rogers, E.	600 0 0
Bell, G.	599 0 0
Nowell and Robson	595 0 0
Saunders, S.	565 0 0
Mears, J. (accepted)	533 0 0
Mayo, R.	470 0 0

GOSPORT.—For alterations to Gosport police-station, for the Hants County Council:—

White and Sons, Landport (accepted) £229 0 0

(Lowest of six tenders received.)

GRIMSBY.—For building Fisher-lads' Home, for the North Sea Steam Trawling Co., Ltd. Mr. E. W. Farebrother, F.R.I.B.A., Grimsby, architect:—

Thompson and Sons, Louth	£1,020 0 0
Marrows, H.	1,007 13 3
Walker and Cook	1,002 8 2
Siminson, S.	999 5 0
Gray, J.	999 0 0
Guy, J.	997 10 0
Chapman, J.	979 9 0
Grant, F., Cleethorpes	970 0 0
Wilkinson, T., Cleethorpes (accepted)	851 8 0

Rest of Grimsby.

GRIMSBY.—For building the Clee Park Hotel, for Messrs. Hewitt Bros., Ltd. Mr. E. W. Farebrother, F.R.I.B.A., Grimsby, architect:—

Smith and Lunn, Newark	£4,680 0 0
Baines, C., Newark	4,500 0 0
Crawshaw, J., Skegness	4,300 0 0
Walker and Cook, Grimsby	4,023 0 7
Wilkinson, T., Cleethorpes	4,010 9 8
Grant, F., Cleethorpes	3,876 19 4
Guy, J., Grimsby	3,800 0 0
Chapman, J., Grimsby	3,798 9 0
Marrows, H., Grimsby	3,767 0 0
Siminson, T., Grimsby	3,696 9 10
Thompson and Sons, Louth*	3,676 0 0
Hewins and Goodhard+	3,400 0 0

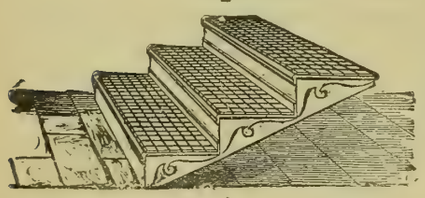
* Accepted. + Withdrawn.

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Bletchley
Bolton
Bolts Bridge
Bombay, India
Bow
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Bristol
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Burscough Junction
Burton
Bury
Borough Road
Mersey Tunnel
Canonbury
Camden Road
Chalk Farm
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Cheetham Hill Junction
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Clayton
Clifton
Clitheroe
Crewe
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Cross Lane
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Dalston
Daubhill
Daybrook
Denholme
Derby
Droylesden
Drighlington
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Dudley Port
Dundee
Ealing Common
Ealing Terminus
Earl's Court
Edgware Road
Failsworth
Farringdon Street
Farrington
Fenchurch Street
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Firsby
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Grantham
Greenwich
Hackney
Haggerston
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Hereford, Barr's Court
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Hollinwood
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Homerton
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Hounslow Barracks
Keighley
Kemble Junction
Kenilworth
Kensal Green
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Kilburn
Kilsby
King's Cross
King William Street
Langley Green
Latimer Road
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Leyland
Leyton
Leytonstone
Lichfield
Limehouse
Lincoln
Little Ealing
Liverpool Road, Manchester
Liverpool Street
Llandudno
Long Buckby
Loudoun Road
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Mark Lane
Maidstone
Manchester
Manchester, Exchange
Manchester Road
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Mildmay Park
Millhill
Milverton
Monkwearmouth
Moorgate Street
Monument
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Newport
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North Brentford
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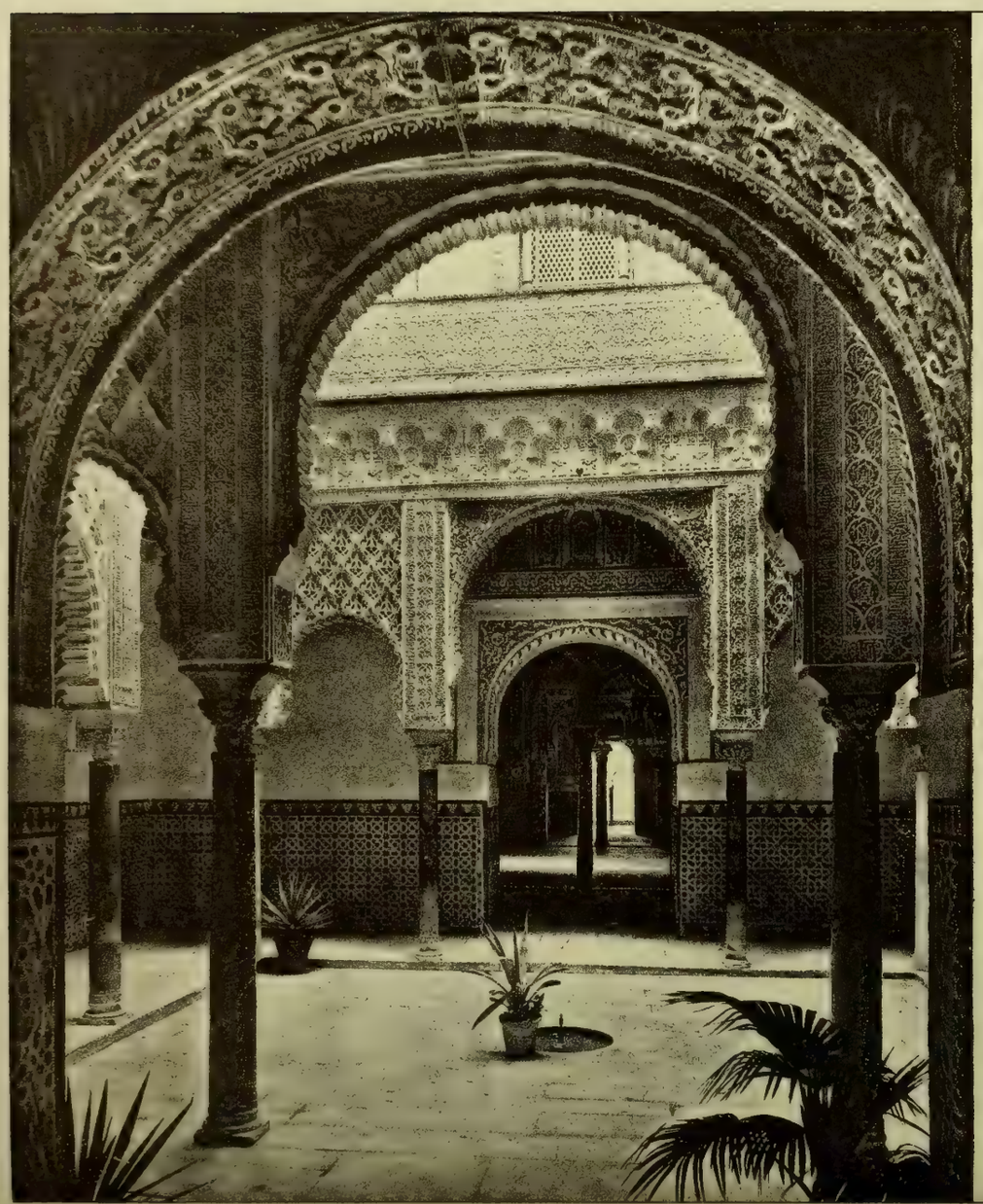
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Dundalk
Dublin Castle
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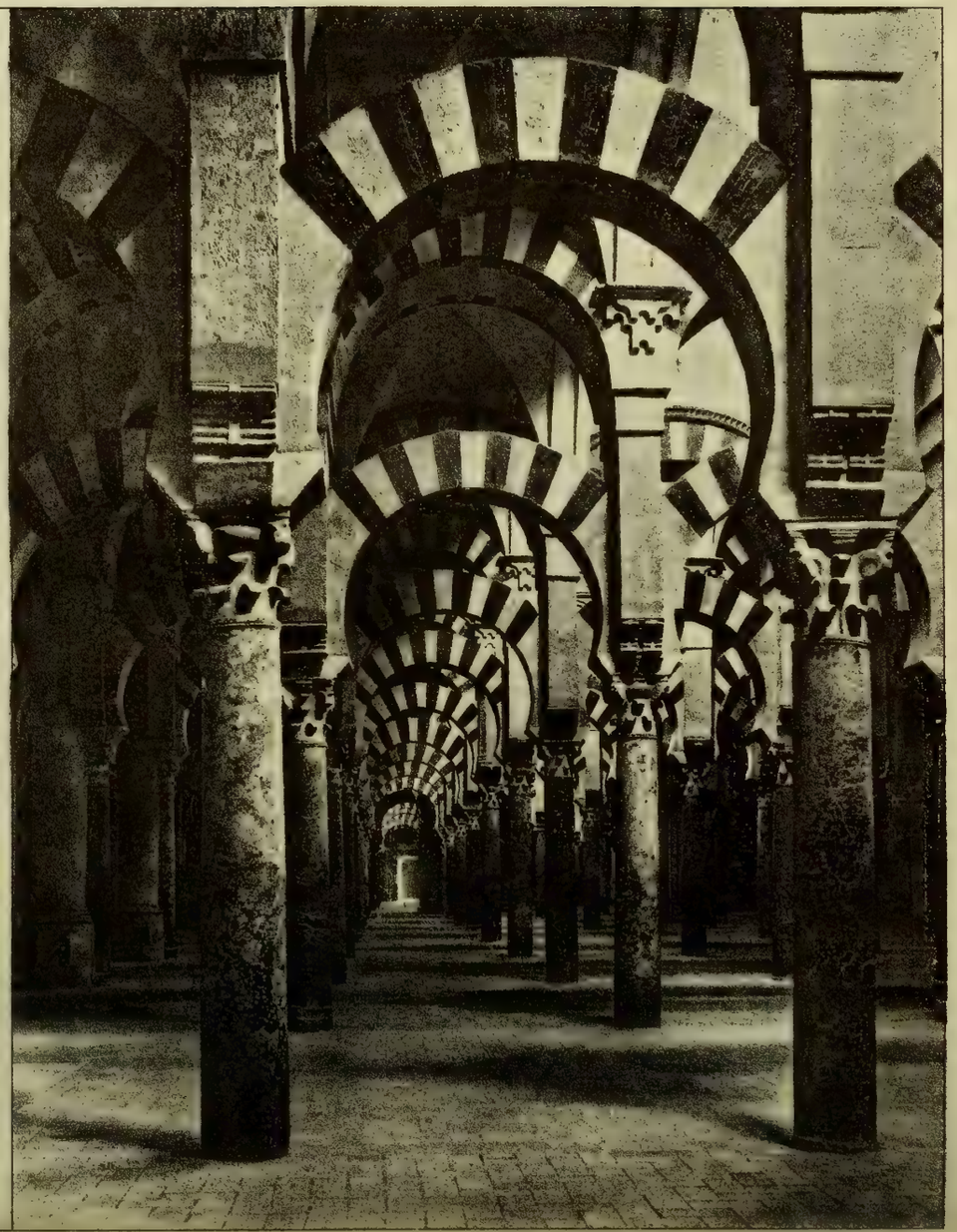
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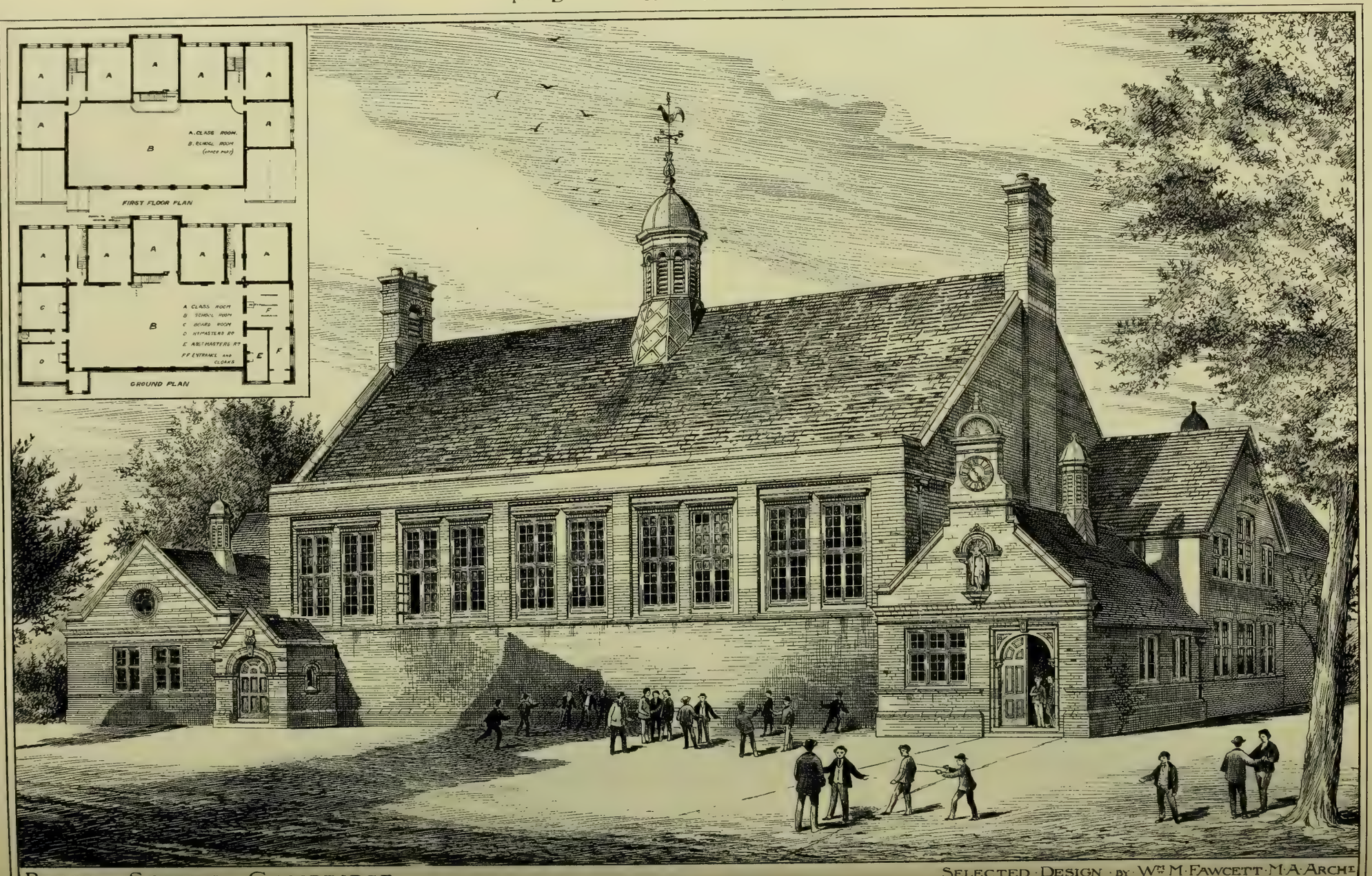
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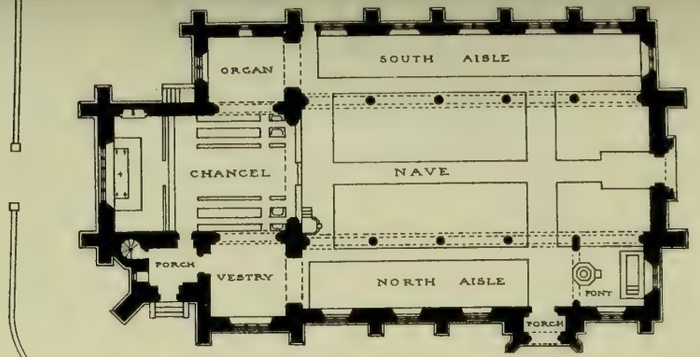


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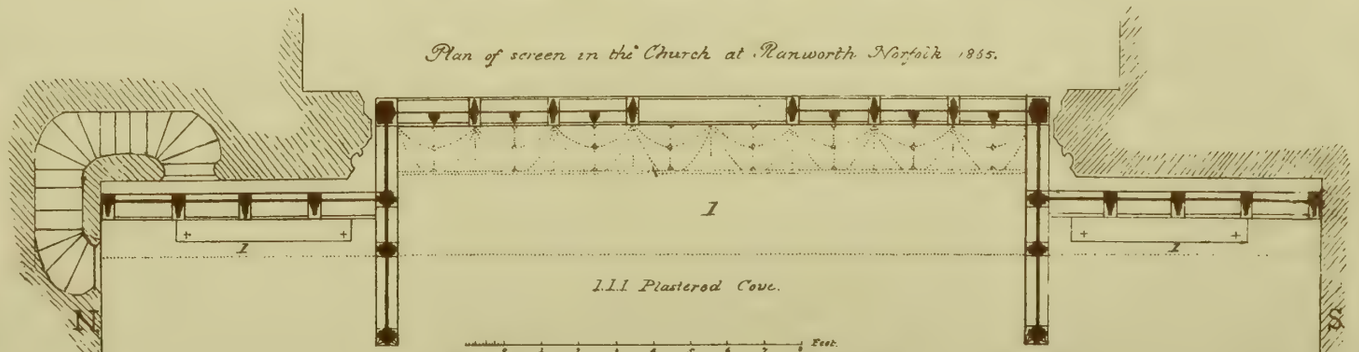
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Plan of screen in the Church at Ranworth Norfolk 1885.















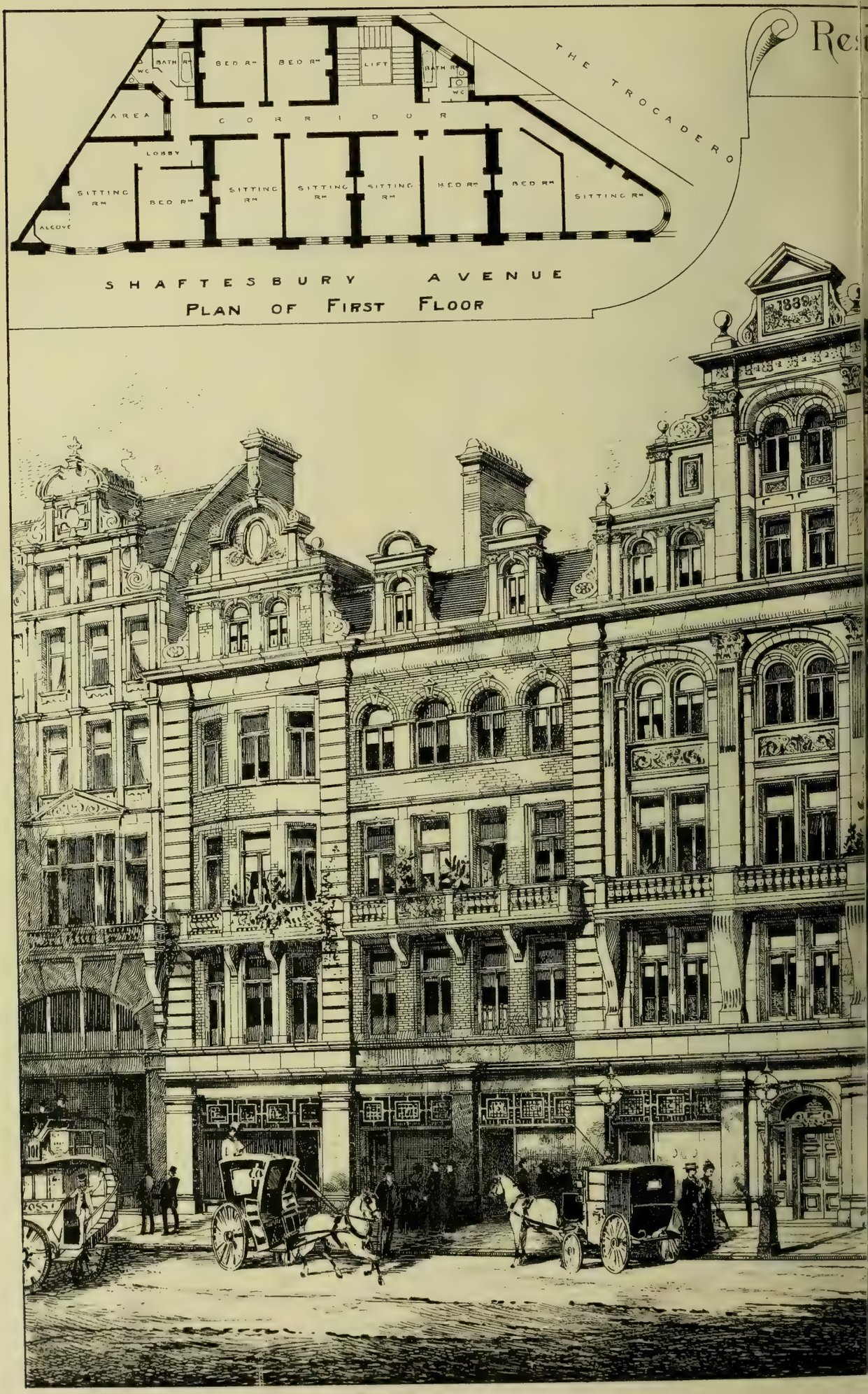
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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1820.
FRIDAY, NOVEMBER 22, 1889.

THE EDUCATION OF ARCHITECTS.

ONE topic above all others seems to have been the keynote of each of the presidential addresses of the architectural societies, and that one is the education of the architect—a by no means new subject, though nearer realisation than it was ever before. When formerly mooted, the question was more as to what the younger students of the profession should do for themselves in the way of improving their opportunities, and of establishing classes at the Association; now the question has been materially widened—it is made to include within its scheme not only the pupil but the practitioner, and the efforts of the profession have been directed to obtain legislative assistance, to make it compulsory on all entering the profession and practising. But though all are convinced of the importance of the subject, there is a disagreement about the means of promoting education, and it is this want of unanimity which is hindering the progress of the movement at the present time. A large outside section of the profession forms a great wedge of indifferentism, if we may so express ourselves, tending to separate still more the two main bodies of the profession, who are engaged in the promotion of schemes on rather different lines. The Institute, who should have taken the initiative, but who have allowed others to do so before they have made any sign of action, have promulgated their intentions. Mr. Alfred Waterhouse, R.A., speaking *ex cathedrâ*, alludes to the results of the scheme put forward for the progressive examinations: a preliminary, an intermediate, and a final examination—a scheme we have already discussed; and he gives the number of those who have been admitted as candidates for the forthcoming examination in London. The number is small, 107, and we cannot say that it represents the general feeling or desire of the profession out of doors. The Institute declares itself as an examining, not a teaching, body; its avowed object is to obtain members, not to raise the standard of architectural education outside its own walls. What says the Association through its president, Mr. Leonard Stokes? Mr. Stokes very truly says of the Institute, "It certainly has instituted a series of examinations for those who wish to *join its ranks*, and it hopes by so doing that in time *membership* of the Institute will carry more weight with it, and the public in time will look to it more for information on matters architectural." While tending "indirectly to raise the tone and standard of education, it is not in itself education. Therefore the Institute as a body is doing *nothing directly* to educate the younger members of the profession." These words fairly explain the efforts of the senior society, and we commend them to the attention of all readers. Again Mr. Stokes, referring to the "student" class of members, lately revived, observes: "The Institute does not at present propose to instruct these students in any way, but simply to examine them at certain stated intervals." The words italicised are significant, and ought to be remembered in discussing this question. Mr. Stokes's proposition to unite the resources of both bodies is commendable; at the present time, they hardly can be said to pull together, as they work in distinct grooves. The Association has been engaged in work of the most useful kind, and many of the younger members of the profession owe their technical education to its classes; yet we do not see how the aims and objects of the two bodies can be so well promoted by uniting. There is room for each; amalgamation often means a loss of individual action, and will not such a union tend towards the suppression of student interest? It is a question worth the attention of members of the Association whether co-operation with the Institute will be attended with the degree of success they anticipate. Certain it is that youth and age hardly ever agree long, and the absorption of the younger by the older and more powerful body would mean yielding on many points. The idea is that the Institute and Association acting conjointly could do much more than they can separately to promote the technical education of the profession; but we fail to see how this would improve the present independent position of the latter, or in what way it would draw from without a larger number of young men. The united institution would still labour under the disadvantage of not possessing a legal authority to compel those outside to join.

Mr. Robert Walker, the president of the Society of Architects, devoted a large part of his inaugural address to the same important theme. All three addresses have been reported fully in this journal, and should be read by every architectural student. Mr. Walker properly says education is the basis of the Bill for registration, the substantial part of the measure. That Bill is intended first to draw together the scattered members of the profession, to register those that are in practice or have a vested position as architects, and to institute a professional examination for all new-comers. The Medical Act, as Mr. Walker pointed out, met with just the same opposition as the Bill promoted by the Registration Committee, especially the section admitting all practitioners under certain stipulations; but this was finally carried by a large majority. One immediate effect of the Bill will be to diminish the number entering the profession, and to raise the standard of education by legislative action. Without legal sanction it is impossible that any successful measure can be carried, and architects, as men of business, must see the force of this argument. Voluntaryism has been tried and failed; for if an individual thinks he can get on without a compulsory test he will do so. There are hundreds of young architects who would like to be registered as qualified men in their profession who do not care to join any society; but at present they have no means open to them except they join the Institute and pay the fees. There is a large number of architects in practice who would like to obtain a recognition of their qualifications in some form. We put a typical case to illustrate our meaning. Mr. A. B. is an architect in practice, 50 years of age, who cannot conveniently give up his business to undergo an examination in London. Not being a member of the Institute, and not caring to join any society, he abandons the idea of passing the examination, though, if he could do so conveniently, and at little cost to himself, he would willingly submit. We say that such is the case with very many architects. How is a case of this kind to be met under existing regulations? Can it be supposed that the bulk of practising architects will join any body to be examined at such a cost to themselves without obtaining some equivalent upheld by law as a diploma? Then it must be distinctly borne in mind that no machinery for examining architects will be successful unless an educational body be established, such as that provided for by the Bill to which Mr. Walker alluded—termed a "General Council of Architectural Education," with branches for England, Scotland, and Ireland. This want cannot be delayed any longer. Young men who are articled to architects are often at a loss where to go for instruction. Some of them who have the advantage of living in London can join classes at the Association, or keep their terms at University or King's Colleges; others who dwell in provincial towns have no other alternative but to join a Science and Art Class or some technical school. Of the proper books to read few of them know anything, and we can judge of these drawbacks by the numerous and varied questions we receive from all parts of the kingdom asking for the names of books to read, and how to work out questions relating to construction.

A great many branches of the architect's education have no authorised instructors. It is true textbooks have multiplied to almost a bewildering extent; in two alone, *geometry* and applied mechanics, the recently-published manuals can be counted by the score; but on professional matters, such as the laws relating to landlord and tenant, easements of light, building by-laws, sanitary building, valuation, the student is obliged to grope his way among books that are either more suited for law students or are only popular guides. In architecture proper there is a remarkable dearth of textbooks. How many times we get the question, Which are the best authorities on the architecture of the Renaissance? Those authors who have written reliable treatises on the Styles are very few, and their works are unsatisfactory in their completeness. They are found to be more as apologists for certain theories and styles, than unbiased teachers: they have written ably as partisans, not as historians. We have no architectural treatises to compare with those of Viollet-le-Duc, D. Ramée, C. Daly, Gailhabaud, Winckelman, Adler, Batissier, Kugler, Hübsch, Sauvageot, and a score of other writers. In construction the French and German works are more numerous, and the application of principles is more thoroughly worked out. Thus we have not many works that will compare with Rondelet's "*L'Art de Bâtir*" in practical value.

The education of the architect will and can never be satisfactory under the present piecemeal *régime* of instruction and pupilage. Specialised construction at present is scarcely made a study. The data, plans, and construction of buildings for different uses are nowhere to be learned, as a system, and the young architect has to pick up his knowledge of them by the examination of a number of buildings supposed to be good types of a certain class, or from a few works of an expensive and very incomplete kind. These are often with difficulty obtained. No one book such as can be found on medical and legal subjects contains in a concise form the principles of domestic, ecclesiastical, municipal, commercial, hygienic, and other construction, the consequence being that no complete system of architecture is within the reach of the student. So it is with special technical knowledge. The trades are imperfectly learned in the architect's office, even under the most favourable conditions, though better opportunities are now given by the opening of technical schools in our large towns. A system of architectural education must be something more than a teaching of styles, of historic types, of art principles applied to a few common kinds of construction, necessary and important as these are to make an accomplished architect. It must be far-reaching enough to embrace the multifarious requirements—at least, in a general sense—of all domestic buildings; of church and school design, of hospital, municipal, and workhouse construction, for which purposes the student ought to have a general acquaintance in addition to his ordinary knowledge, of ecclesiastical history, ritual requirements, school discipline, classification of pupils and patients, laws of hygiene, and a variety of other kinds of prescribed forms. A range of instruction such as here sketched

cannot be taught until many of the delusions about art have been swept away, and the absurd distinction between fine art architecture and building has given way to a sounder and more logical view of the relationship between them.

VARIATIONS IN CONTRACT.

THERE are employers of architects who think they have the right and should possess the power of varying the design and construction of buildings whenever they wish to do so. With these convictions strongly rooted in their minds, it is extremely unfortunate should the architect express plainly his opinion about the invalid nature of such proceeding, and refuse to permit any alteration to be made. We have often found clients ready to make suggestions of alterations without the slightest hesitation, and if their demands are not conceded, to make it very disagreeable. In a form of agreement recently published, this power to vary, extend, or diminish any part of the works is actually given to the employer; he, in fact, is to be able at any time to "vary the form of, omit, extend, or diminish any portion of the work under the same conditions and price as those specified, &c." Where would alterations end, if such a clause were permitted? We can imagine a vacillating employer, or some fickle-minded lady employer under such a rule, and pity the architect who had to submit to every whim and fancy, and to alter his design as it was being carried out. No; such a condition could never be tolerated, as it would practically set aside and invalidate the contract between the two parties. Of what use would a contract be if continual changes were made in the design? But this power to vary, extend, or diminish is unfair to the contractor, unless he receives a remunerative price for the alteration. A schedule of prices submitted with the tender is necessary and equitable to both parties as defining a certain price or rate for any extra quantity or omission; but it is very different when an employer of changing mind can make a large omission, and require the contractor to deduct the amount at the same price as he tendered for the work. In this case the schedule is an unfair means of binding the builder to a price at which he could not have tendered under the altered circumstances. In most agreements it is customary and fair towards the contractor to insert a clause that, in case any extra or omitted work is proposed to which the schedule of prices does not apply, the contractor is not compelled to execute the order until a price has been agreed upon. A clause of this sort becomes absolutely necessary when the employer assumes the power of making alterations, as it then is a useful check to vexatious alterations and omissions. Another objection to a client's interference is that the architect's labour is unnecessarily increased without, in many cases, a corresponding advantage in the design. He would be called upon to ascertain the difference in value between the specified and the varied work, to credit omissions, if any, and make out the account every time; his orders would have to be taken to the employer to be signed, and his proper position, in fact, would be exactly reversed. These grounds are strong enough without adverting to others, to show the undesirability of giving the employer the power of altering or countermanding work.

Of all the contract clauses the one giving the architect power to make alterations is the most important in its action on the contracting parties, and both architects and builders should endeavour to make it as perfect as possible. There have been various suggestions and forms for clauses of this kind. The conditions agreed to by the London Builders' Society, and issued by the Association of Master Builders of Great Britain, gives authority to the architect to alter or add to the works without vitiating the contract, all additions, omissions, or variations made, for which a price may not have been agreed upon, to be measured and valued, and certified for by the architect, and added to or deducted from the amount of contract, according to a schedule of prices annexed, or where the same may not apply, at fair measure and value. This clause implies by its wording the importance of agreeing to a price before any variation is made, in the absence of which the schedule annexed or fair measure and value may be substituted. The contractor is protected by the clause, for he has it in his power to decline to make any important deviation upon the terms of his schedule. In the general headings sanctioned by the Institute this is made even clearer, for in the clause it is stated that if the architect shall require to make any variation which he declines to order as an extra, the contractor "may reserve the question of his right to be paid for the same until the final settlement of accounts," and in the arbitration clause such a question can be referred to the arbitrator.

In contracts based on low tenders it is obvious that the contractor would often lose if he undertook to make a variation on the same terms as his schedule. The deviation often entails increased cost beyond that of carrying out the work in accordance with the drawings and specification, for in many cases the variation may cause additional labour in ordering or counterordering materials, in resetting out the work, in altering the work already performed, or in the delay caused by such alteration. A sum to be agreed upon appears to be a reasonable and just mode of treating what is virtually a new contract. On the other hand, the schedule is desirable when additions are made, as in this case the builder is being benefited, and it would be unfair to the employer if the contractor refused to add to a building unless he were paid at a higher rate. A variation may mean an increase of labour, as in making a bay window instead of a flat one; or it may mean the making of a door in one place instead of another, in which case there may be no increase of labour. These circumstances ought to be considered by both parties, the one in ordering, and the other in accepting alterations and variations. The arbitration clause is a way to reconcile the conflicting opinions of architects and builders on these points, though it would save much trouble if every question of variation or alteration involving any doubt was made the subject of a separate agreement, and a price for the same agreed to before it is carried into execution.

ARCHITECTURAL BRICKWORK.—XXIII.

SINGLE FLEMISH BOND.

WE here give a few examples of bond used in external walls in which openings occur. Single Flemish bond is a common and generally-used bond, as it is pleasing in appearance, and enables the bricklayer to use his bats or half bricks in the stretching courses. This bond is called "single" because a wall built in it shows Flemish bond on the external face, and English on the other side. As may be inferred, single Flemish bond must be more than a brick thick, as it has on the outer side stretchers alternately combined with headers, and real headers on the inner side. The headers shown in the stretching course outside of wall are all half bricks, but on the heading course the headers are whole bricks, with stretchers between them, and each stretcher has another laid stretcher-fashion behind it. Plan 3 represents a wall of this sort: left side shows the stretching course, with the headers all half bricks, between which are laid stretchers, English bond making up the substance of the wall; right side represents the heading course, the headers all whole bricks, with two parallel lines of stretchers between. The student will notice that the vertical joints break or overlap in the two successive courses.

WEAKNESS OF FLEMISH BOND.

Thus single Flemish bond is a combination of English and Flemish, the weakness of such a wall being in using the half bricks in the stretching course. If a section be made of a wall of this description, it will be found that if the plane cuts through the wall vertically through one of the false headers in the stretching course, one unbroken vertical joint occurs from top to bottom. In the plan, too, it will be seen an unbroken joint occurs half a brick from face of wall. Batty Langley, who wrote on brickwork, and who was a better authority on the subject than on architecture, observes that about the middle of the last century walls were built in London having headers only in every fifth course. This inferior kind of Flemish bond arose from using the best stock in the face of wall with thin joints, the backing being made of inferior *place* bricks in rougher mortar; this arrangement necessitating five courses of the face bricks to four courses of the place bricks. The only through bond between the facing and backing was thus the headers at every fifth course. The construction of a wall thus composed allowed a continuous unbroken fissure behind the facing except the bond at every fifth course.

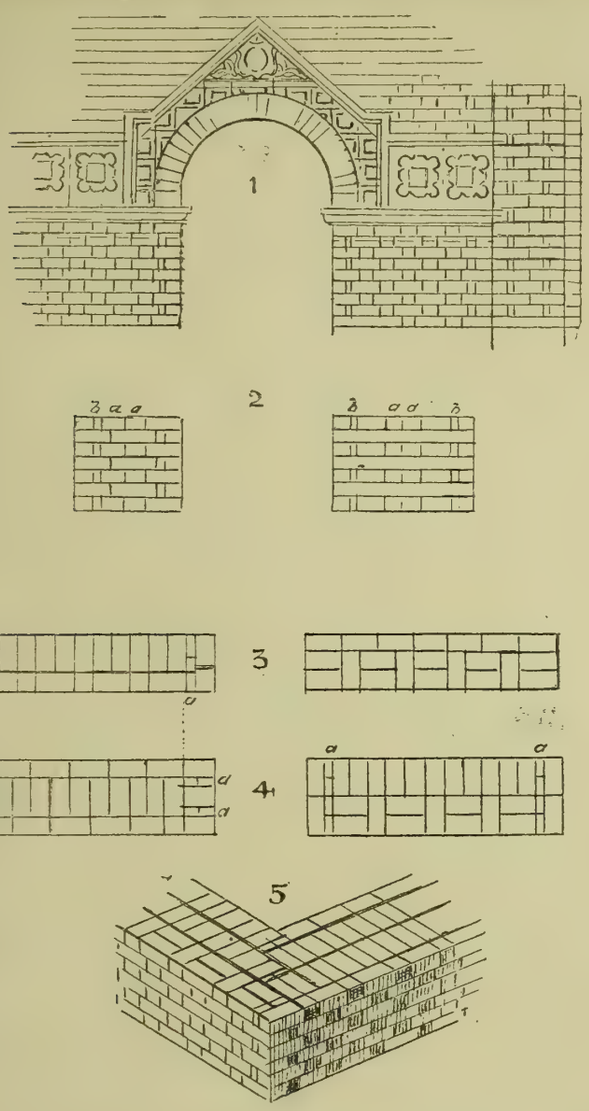
Where strength rather than appearance is desired the single Flemish is preferable to the double Flemish bond, in which both sides of the wall are laid in this manner, or with false headers and stretchers; inasmuch as in the latter wall unbroken joints of 9in. long and at intervals of half a brick occur on both sides, whereas with single Flemish they occur only near the outer face of wall. For strength, therefore, it is better to use English bond for all internal walls and the inside of external walls, a plan which was followed in the building of the British Museum and other large structures.

ADVANTAGES OF ENGLISH BOND.

Besides being stronger, English bond has the merit of breaking all the vertical joints from bottom to top. Many of the old brick buildings are executed in this bond—Cobham Hall, the seat of the Earl of Darnley, Restoration House, Rochester, and several buildings of the Elizabethan and Tudor period, are built in this manner. For ornamental purposes, a mode of building walls in which headers are used in every course is deserving of mention. For diamond and other patterns this kind of bond has obvious advantages; also for circular work, such as bay windows and turrets, and rounded corners, the headed bond is useful, and is generally employed, as the curvature can be more easily executed with headers than with stretchers. The headers can be laid in half brick and whole brick alternately in each course, or as half bricks in one course and whole bricks in the next.

OPENINGS AND PIERS.

Again referring to our last article (p. 617, Figs. 1 and 2), we may see the importance of attending to the bond of piers between windows and other features. In the elevation, Fig. 1, right-hand side of opening, we have shown a pier of $3\frac{3}{4}$ bricks (not $3\frac{1}{2}$, as printed), consisting of first row, half-brick, quarter-brick, a three-quarter brick, a half-brick, a whole brick, a quarter-brick and last next pilaster a half-brick, or, in all, $3\frac{3}{4}$ bricks; and in the second row 1 B, $\frac{1}{2}$-B, 1 B, $\frac{1}{4}$-B, $\frac{3}{4}$-B, = $3\frac{3}{4}$ bricks. A better and more regular bond would be obtained by making this pier four bricks wide, in which



the same appearance would be obtained, but there would be only whole and half bricks, alternately arranged. On the other side of opening we show a three-brick pier, which gives an irregular bond, the first course having ½-B, ¼-B, 1 B, ½-B, and ¾-B = 3 bricks, and the next course a stretcher, *a*, two headers, *b* and *c*, and stretcher, *d*. In piers of five bricks, there would be in one row a header and closer at each end next the openings, and in the centre three headers, together with stretchers between; in the next course, at each end, a stretcher next a header, and in the centre two stretchers together.

REGULAR AND IRREGULAR BOND.

We give an elevation of a part of wall in which a doorway is introduced, 1. The pier on the right-hand side of doorway shows 5½ bricks in width to the corner pilaster, which is 2 bricks wide. In one row next opening there are stretcher, header, stretcher, header, stretcher, header, and stretcher; in the next, header, closer, stretcher, header, stretcher, header, stretcher, closer, and header, making in each course 5½ bricks. The appearance is regular. If the pier was four bricks in width, in one course there would be a header and closer at each end, and between them a stretcher, header, and stretcher: in the next there would be a stretcher at each end, and between them a header, stretcher, and header. In elevation 2 are shown two piers, one of 2¾ bricks and the other 4½ bricks in width, which represent irregular bond. In the first case we have a header and closer on the left hand; *a* and *a* are headers, and then comes a stretcher; the next course two stretchers come together, then a closer and header, by which it will be noticed that one closer occurs at alternate ends. In the 4½-brick pier two headers, *a a*, come together in each course, producing irregular bond.

In plans 3 and 4 we show successive courses of piers of 1½ brick and 2 bricks thick in Flemish bond, each of 7 bricks in width, and intended for piers between square-jambed openings. The first plan in each case represents the stretching course, and the second the heading course. It will be seen that the jambs are worked by closers *a a*. The isometrical view of a quoin of a wall of three bricks thick (plan 5) will explain the manner of working the angle at the junction of two walls as at the corner of a building. The top course shown on plan represents the stretching and heading courses in the separate walls, and it will be noticed that the closers are arranged *en échelon* in a diagonal direction from the outer to inner angle, parallel to each other; in the next course they are placed crosswise.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE second meeting for the present session was held on Monday evening, Mr. MacVicar Anderson, vice-president, in the chair. The deaths were notified of William Millican, of Leicester, and of Harry Robert Newton, of Weybridge, Fellows. The Chairman announced that, by resolution of the council under By-law 23, the following had ceased to be members in accordance with By-law 20:—Thomas Henry Fleeming, Waterloo-road, Wolverhampton, and Henry Parsons, Worcester House, Hampton Wick, Fellows; and Frederick Hemings, 7, Fenchurch-street, E.C.; Herbert W. Railton, 31, Cloudesley-street, Barnsbury; William Andrew Rolfe, 17a, Great George-street, S.W.; Thomas G. P. Ward Sheppard, 13, Hill-street, Rutland Gate, S.W.; and John Watt, Temple Chambers, E.C., Associates. The chairman stated that the restored church of St. Mary-le-Strand would be open to the public for one week from the following Wednesday, from 10 a.m. till 4 p.m.

The following 17 gentlemen were elected by ballot as Fellows: John Edward Sears, 16, New Bridge-street, E.C.; Frederic Richard Farrow (holder Godwin Bursary 1884), New-court, Carey-street, W.C.; James Herbert Stones, Blackburn; Arthur Wells, Hastings; Joseph Barker Daniel Wall, 32, Walbrook, E.C.; Hildebrand Attwood Wooster Reeves, Buckingham-street, Strand, W.C., and East Grinstead; Delissa Joseph, Basinghall-street, E.C.; John Clarkson, 28, Great Ormond-street, W.C.; Charles James Dawson, Barking; James Edward Clifton, Swanage; Frederick William Ridgway, Dewsbury; Albert Edward Murray, hon. secretary of the Royal Institute of Architects of Ireland, 37, Dawson-street, Dublin; John Howard Pentland, B.A., B.E., Architect's Office, P.W.D., Dublin; John Tweedale, Leeds; Richard Mauleverer Roe, Basinghall-street, E.C.; William Henry Syme, Watford; and Herbert Walker, A.M.Inst.C.E., Nottingham. Under a new by-law next were elected, by show of hands, the following candidates as Associates (6): Herbert Lingard Whitley, Talbot-road, Bayswater, W.; Gilbert Wood, Southsea; Ravenscroft Elsey Smith (Greek Travelling Student), Temple Chambers, E.C.; Bertram Norman Southall, Finsbury-pavement, E.C.; Henry Vaughan Lanchester (Owen-Jones Student, 1889), Bedford-row, W.C.; George Kenyon (Tite Prizeman, 1888), Park-row, Albert-gate, S.W.; and as Hon. Associates: Col. Samuel Swinton Jacob, Engineer to the Jeypoor State, Jeypoor, Rajpootana; and John Dibble Crace, 15, Gloucester-place, W.

THE APPLICATION OF IRON AND STEEL TO BUILDING PURPOSES.

A paper on this subject was read by Frederick T. Reade, A.M.Inst.C.E., Hon. Associate. Having dealt with the question of foundations and piers, Mr. Reade said, as the greater part of the question discussed had to do with weights to be supported, he should begin with the subject of columns and stanchions and the foundations on which these rested. The primary question should be the nature of the soil on which a building was about to be reared. The results of many experiments showed that two tons load per superficial foot of foundation was a safe limit to assume for ordinary clay, gravel, &c. Having settled on a limit of pressure on the earth, he next considered the question of an isolated column as being the simplest case, and assuming that it carried a not unusual load of 50 tons, such a column would weigh about 15 cwt., say one ton; thus 51 tons would be discharged on its bed stone. This bed stone might be taken as ordinary sandstone, which would carry with safety a load of 25 tons per foot; this determined the size of base flange of column, which in this case should have an area of 2ft. at least. In a building where the ground-floor supports were principally columns, and especially for a corner shop where there was only a party and back wall, it was advisable to make the column or stanchion bases larger than given by above rule to give lateral steadiness to the building. A practical limit for a bed stone was 4ft. by 4ft. and 24in. in thickness; where the base had to exceed these dimensions a cast-iron block should be employed. The concrete block under the bed stone, or base plate, or brick pier should always be mixed with Portland cement, for the ordinary lime concrete was long in setting, and in large masses it would take years before the centre of block became hard. One of Portland cement to eight of other ingredients, if carefully and well mixed, would safely bear a load of 5 tons per superficial foot. These other ingredients should be hard materials, as gravel, broken stone and bricks, or bats of hard quality. Passing on to consider the dimensions of cast-iron columns and stanchions, Mr.

Reade observed that a cast-iron hollow column to carry 50 tons should have a ratio of about 15 to 20 times its diameter for its length; this might safely be loaded to 2½ tons per square inch of sectional area; and, if a diameter of 9in. and a thickness of metal of 1in. were assumed, they got an area of 25in., 20 per cent. in excess of their requirements; but for hollow columns it was advisable to have a liberal margin of safety, as, unless great care were taken in the moulding, the shifting of the core might cause an unequal thickness of metal in the casting. The hollow column was, theoretically, the strongest form of section; but the probability of an unequal thickness of metal was an objection to its use: this might be guarded against, to a certain extent, by specifying that some of the columns should have small holes drilled in their shafts to ascertain the thickness, and that, where the metal on opposite sides differed more than one-fifth of the proper thickness, such columns should be broken up. Another objection to the form of the hollow column was that it did not lend itself very readily to being cased in a fire-proof material. Assuming, however, that a hollow column had been decided on to carry 50 tons; the size of its base flange had been already given, and it should have a bold rounding at its junction with the shaft, and bracketed in four directions; the thickness of the base flange should be from one-eighth to one-quarter more than the thickness of the shaft—in this case 1¼in. It would often be found that stanchions of the + or H section were preferable. They had this advantage, that the whole surface of the metal could be seen, and any imperfections detected; the absence of the central core greatly reduced the risk of an unsound casting, while in tiers or stacks of stanchions such sections gave great facilities for making simple junctions of girders and iron joists at the various floor levels. In designing a stanchion of H section to be placed flat against a wall, the least width of its section—viz., the width of the flanges of the H section, was the measure of its strength, and therefore an H section 12in. by 6in. was not so strong as one 12in. by 9in., even though it contained the same sectional area. The commonly employed ⊓ or ⊓ section was not to be recommended, on account of the very unequal distribution of compressive stress over its section, and also on account of its liability to become bowed in cooling—a risk which attended all very non-symmetrical sections. These channel sections were generally fixed with the web or back placed against the wall; but the stanchion was under better conditions if the web was placed outwards towards the centre of span. Whatever form of section of column or stanchion was decided on, it was important that the cap plate on which the girder rested should be well chamfered back from the front to prevent the girder from bearing on the extreme front edge of the cap plate, and, in case of very narrow stanchions, the cap plate should also be narrow, to prevent as far as possible the deflection of the girder tending to bend the stanchion. All bed stones for ends of girders in walls should have their front edges chamfered in the same manner, and for a distance of 3in. from the face. In speaking of wrought iron and steel stanchions, the author remarked that it was not uncommon to use stanchions made of rolled joists, the cap and base plate being fixed to the joists by angle-irons or gusset plates, or both combined. As the ends of joists could not be considered as bearing accurately on the end plates, without special care in the workmanship, such gussets and angles should be designed so that the shearing or bearing resistance of the riveting alone was sufficient to transmit the load to the base flange. For very heavy loads, say 150 to 300 tons, it was usual to make stanchions of wrought iron, of tubular section, with web plates and angle-iron, or with webs made of rolled joists or channel irons. Cast-iron base plates direct on concrete were rarely used, unless the load or column exceeded 100 tons. Their depth in centre, and the thickness of metal, would be influenced by the number of the radiating arms and their thickness; but a rough approximation would be 2½in. in depth for every foot in diameter, and a nearly uniform thickness to that of the column or stanchion on it. Thus, a base plate 6ft. diameter would be about 15in. deep in the centre, and as the stanchion on it would have to carry a load of 130 tons, it would work out to about 1¾in. metal, and base plate should have the same thickness. Such a base should have some holes about 3in. diameter cast in the spaces between each pair of radiating arms, so that when the base plate was wedged up, and cement was run under same, it could be seen to flow at these holes, and thus make certain that the whole area of the plate was covered by cement. Cast-iron girders, now rarely used, should never be employed for great or variable loads, and their proportion of depth to span should rarely be less than $\frac{1}{10}$. They could be used with advantage for carrying window backs between cast-iron stanchions in light areas in interior of buildings, or in fronts constructed of iron stanchions and very little brickwork. In such cases their span would rarely exceed 10ft. to 12ft., and their load would only be one 9in. window back, and half a bay of wooden or concrete floor—probably not exceeding a total of six tons distributed. Although, theoretically, the top flange needed only a small area, yet, practically, to carry 9in. brickwork, it had to be of such width that, to comply with the theoretical conditions, its thickness would be very small compared with the rest of the section. For practical reasons, it would be unsafe to have much difference in the thickness of metal, and it would not be advisable to make top flange less than ¾in. thick, the web to taper downwards. Thus, supposing bottom flange was 1in. thick, the web might be ⅝in. at bottom and ¾in. at top, with bold corners or mouldings in angles where joining top and bottom flanges; vertical ribs or stiffeners should be put between top and bottom flanges about 36in. apart; and, as the material gave facilities for treating these ornamentally, they could be moulded on the face and at ends. Proceeding next to treat on wrought-iron girders, Mr. Reade remarks that the simplest forms were rolled-iron joists. He drew attention to the variation in the amounts of the safe loads given in the lists by manufacturers and dealers in rolled joists. They very rarely gave the limit of stress per inch on which such sections were calculated, and this accounted for the discrepancies between different lists, in which joists of identical sections had safe loads appended to them, which in some cases varied nearly 25 per cent., the reason being that the smaller load had been calculated for a stress limit of 5 tons per inch, while those showing heavier loads had been taken on a limit of 6 or 6½ tons per inch. A useful and economical form of girder could be made by rolled joists, with additional flange plates riveted on. The mode of calculating its strength or sectional area was identical with that given for wrought-iron girders further on, with this difference: that, considering the inferior quality of the material in rolled joist flanges, the limits of stress for these sections should not exceed 5 tons per inch of sectional area, and, in calculating this, only one rivet-hole need be deducted from the joist flange, the holes not being placed opposite to one another. The greater part of the flange section being usually in the joist itself, fewer rivets were required to attach the plates than in a built-up girder. If only a single plate top and bottom was used, ¾in. rivets at 8in. pitch placed zigzag would suffice. The holes for rivets in the joist should always be drilled, for the iron in the flanges was necessarily under worse conditions than the rest of the metal in the joists; and he had often seen cracks in rolled joist flanges extending from the rivet-holes to the edge, the strength of girder being diminished thereby to the extent of 10 to 20 per cent. Heavy-section rolled joists carrying loads not exceeding 20 tons might have their attachments made to columns; but in the case of heavier loads, and nearly always in the case of compound girders, vertical angle irons should be riveted on each side of ends of web, partly to act as end stiffeners to it, and partly as a means of making a more reliable connection to the column or stanchion. The process of calculating the strength and designing the section of a girder was next described. The span of a girder—for calculation—was the distance between the centres of its bearings: its depth was the depth between the centres of the sectional areas of the flanges—and in ordinary girders of angle-irons and plate-flanges it was usual to take the width of the web-plates as the depth for calculation, and it was important that this should not be a very small fraction of the span; if less than $\frac{1}{20}$, it would either have extreme deflection, or be wasteful by excess of material in the flanges; or, if more than $\frac{1}{10}$, there would probably be an excess of material in the web itself. Let them suppose a girder had to be designed, of 20ft. span, to carry a load of 30 tons, equally distributed over its length. He would assume that the circumstances of the case allowed of almost any depth, and as the limits of $\frac{1}{12}$ to $\frac{1}{20}$ of the span had already been given, he would take the mean, or $\frac{1}{16}$ of the span, which was 15in.; this would be the depth of the girder between the inside of the flanges, which in an ordinary girder might be considered as the centres of the sectional areas. The first thing to be determined was the measure of the effect of the load, or the "bending moment," in words, the load in tons multiplied by the span in feet, and the product divided (as the girder was a form of lever) by 8 for distributed loads, or 4 for a central load, thus—

$$\frac{30 \text{ tons} \times 20\text{ft}}{8} = 75\text{ft.-tons.}$$

This was the effect of the load or greatest bending moment in the centre of the span, and they next had to find what section of girder was required to resist it, or the moment of resistance. The depth being already fixed at 15in., he would suppose the material was to be wrought iron. If the load assumed was a dead load—*i.e.*, a solid mass of brick or stone wall weighing 30 tons—the limit of stress for the material named should not exceed five tons per inch. If it were a mixed load—say 15 tons of dead weight and 15 tons of floors which would never be completely loaded over whole area—part of the floor load became hypothetical, and they might increase the limit of stress to 6 tons per inch. Taking 6 tons as the limit of stress, the moment of resistance would then be the depth in feet, equal 1¼, multiplied by the limit of stress, 6 tons, multiplied by the sectional area of one of the flanges. As the moment of resistance had to be equal to the bending moment, the required area of the flange would be the bending moment, or 75 tons, divided by 6 tons limit of stress multiplied by 1¼ft. depth, or

$$\frac{75}{6 \times 1\frac{1}{4}} = 10\text{in.};$$

this was the net sectional area of the flange after deducting the rivet-holes. It was formerly considered necessary to make the top flanges of a wrought-iron girder stronger than the bottom; but the general practice was now to make them equal, except under special circumstances—as, for instance, bridge or roof girders where the top flange had no lateral bracing or other support. Most of the calculations for a girder could be determined by the rules of graphic statics. In designing girders beyond 30ft. long, and with flanges built up of several thicknesses of plates, it was necessary to make the plates in such lengths that their weight should not exceed the limits allowed by the iron-makers without extra. This limit of weight might at present be taken at 6 to 8cwt., and the limit of area at 30ft. It was of the utmost importance that all riveting should be done in the best possible manner. The "snap" or end of rivet, which was hammered out while red hot, should project uniformly all round the diameter of the rivet; they should be of uniform size, and any of them showing radiating cracks, or being of a size much smaller than the others, should be condemned; also, wherever countersunk rivets were required for bearings, &c., the plates or angles should have the rivet-holes countersunk by the drilling machine, and should show on the outside at least ⅜in. to ½in. larger in diameter than the size of the rivet-hole. It was a common practice to trust to the taper given to the holes in the process of punching, and so save the small additional cost of countersinking. This could not be too strongly condemned, as such rivets were often loose in the hole, and thus doing no work. It was easy to detect such loose rivets by placing the finger on the snap or countersunk end, and lightly tapping the head with a hand hammer. The movement of the rivet in the hole, if loose, would be immediately detected, and they should be cut out and replaced by new perfect rivets. The process of designing a girder in steel was exactly as already described, except that a higher limit of stress was introduced into the calculations, it then becoming 7 tons for a dead load, and 8½ tons for a mixed load of floors and brickwork, or floors only. It was not advisable to make the webs of steel girders as thin as the increased strength of the material would seem to render possible, except in girders of dimensions much beyond his example. In the rivet-holes in both materials it was usual in good work that all holes should be drilled; but in steel girders of any description this

was compulsory, for the effect of punching upon the steel was to weaken the metal for a certain distance round the hole. This was sometimes remedied by punching the holes to about ⅛in. less than the diameter of the rivets, and then drilling out the holes to the larger size. An adaptation of iron to the purposes of shoring was mentioned, which was useful in the case of an opening requiring to be cut through a wall at such a height above ground level that ordinary wood shores and needles would be costly, and would also prevent business being carried on in the lower stories during the alterations. In such a case rectangular frames could be constructed of rolled joists or channel irons, connected at the corners of frames by tightly-fitting bolts. The upper and lower members of the frames were then passed separately through small openings in the wall, and the vertical sides bolted up to them on opposite sides of the wall. The weight of the wall above could then be taken up by the frames by wedging or other adjustment, and the portion of wall between the upper and lower members of the frames cut away for the insertion of the girder or girders. The phrase "Builders' ironwork," which had unfortunately now become almost a trade term, could not be too strongly condemned. It was used to designate an inferior description of work considered good enough for ordinary buildings. Where, as in buildings generally, the constructional ironwork was usually covered, a fine finish to girder work, such as planed edges of plates, was perhaps superfluous, except where flanges of girders were to be visible; but it could not be too strongly insisted on that in all other respects—such as good riveting, careful jointing, and good fitting of vertical web stiffeners, &c.—there was quite as great a necessity for good workmanship and materials in ironwork for buildings as in the best description of railway and bridge work.

Mr. Robert Walker, in proposing a vote of thanks to Mr. Reade for his paper, said after considerable experience he could endorse all he had said as to the dangers of ironwork in buildings. Of late there had come into the market much rotten ironwork, rolled joists and castings that were totally inadequate to the loads that they were supposed to carry. He had inspected cast-iron columns so badly cast that they had a thickness of ⅛in. on one side and 2in. on the other. Architects failed to realise the immense importance of using both cast and wrought iron properly. In almost all the accidents that had proved fatal which he had had to investigate the point of failure was the connection between the iron and brickwork. Iron construction was practically ignored in the Metropolitan Building Acts and its amendments, and the district surveyor, if he believed it to be wrong, could only condemn it as a dangerous structure. Architects should never pretend to be engineers. The more clearly they associated themselves in works of this kind with the specialist in engineering, the better would it be for themselves and their profession. Nothing was more likely to lead the young architect astray in his calculations than the wretched stress cards sent round by certain firms. The only safe way was to specify that all ironwork should withstand certain tests.

Mr. G. Aitchison, A.R.A., in seconding the motion, asked if it was not a fact that the depth of bed-plate specified for the bases of columns was often too little, and whether it was not a mistake to use stocks for such work?

Mr. T. H. Watson having spoken, Professor Kerr said the work of the architect had so many branches at the present day that he could not master all, and he would gain in a client's opinion if he admitted that he consulted an engineer as to the ironwork. It was essentially important that precision should be observed in fixing; in every case of accidents during construction they could be traced to the point of connection between the ironwork and other materials. He feared some remarks made by Mr. Reade on the amount of load that could be brought upon a floor would tend to lead young architects to underestimate the probable load; this would be highly dangerous. The architect was often pressed by parsimonious clients to economise; but he should never yield to the temptation to minimise his factor of safe-load.

Mr. J. Tavenor Perry did not think an architect should specify any particular firm for his ironwork, but should rely on testing samples, and should give to the client the name of the engineer whom he consulted on the matter.

Mr. Cole asked as to the difference between iron and steel joists, and whether the latter were reliable in quality.

Mr. Reade, in reply, said he thought the district surveyors as a body ought to make representations to get some recognition of ironwork in any amendment of the Metropolitan Building Acts. He had seen scandalous instances of bad quality of material and want of supervision in London. He agreed with Mr. Aitchison that engineers did not specify sufficient depth of bed-plate. As common stock bricks cracked under a pressure of from 17 to 18 tons, they should never be specified as bases for heavy iron columns. It was very difficult to give a description of steel as distinct from iron; indeed, it was only possible to distinguish between iron and steel by chemical analysis, or by testing its elasticity. It was true that steel appeared much finer in grain, and the fracture was also finer than iron, but even an old expert might be deceived. He had seen a bar of iron broken by a series of small blows, which showed small, fine fibres, while large crystals were apparent at the other end of the same bar, broken off by a sudden blow. The builder ought never to be allowed to fix the ironwork, for the drilling and setting of rivets was liable to be scamped. He had not intended to reduce the assumed weights on floors, but wished to draw attention to the distinction between permanent and anticipated live weights in his calculations. He quite agreed with Mr. Tavenor Percy that it was not judicious to mention the name of any particular firm in a specification: one reason was that some good-natured friend would be sure to insinuate that the writer of the specification had an interest in that house; but he should reserve the right to reject ironwork procured from any man of whom he did not approve. The objection to making the ironwork a separate contract was that it promoted constant rows between the iron merchant and builder, whereas if the latter had his profit out of the work all went smoothly.

THE ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of the Association was held on Friday evening, the chair being occupied by Mr. Leonard Stokes, President. The following fourteen gentlemen were elected as members:—Messrs. R. S. Lorimer, H. D. Blowers, T. M. Smith, E. Penfold, J. A. Brand, J. Lockhead, T. McGill Cassels, W. Bone, J. A. Barclay, J. Begg, G. Watson, G. W. Wilson, C. H. Norton, and A. Stratton.

THE PROPOSED COMMON ROOM.

Mr. T. E. Pryce announced that the Common Room would be opened for the first time at 9, Conduit-street, on Friday, the 29th inst., at 6 p.m. After that date the room would be opened for the same purpose at 6 p.m. on every evening on which the various classes meet for the convenience of members attending the classes, and to give them the opportunity of meeting and discussing any subject of interest. On Thursday, the 11th Dec., at 7 p.m., the first general common room will be held in the committee-room, when Mr. Sidney Beale and Mr. A. O. Collard will open a discussion on "The Position and Prospects of Architectural Assistants."

THE PARIS EXHIBITION.

A paper on the recently-closed Exhibition in the Champ de Mars, illustrated by numerous photographs, and large scale drawings in white on blue paper, lent by the architects and engineers, was read by Mr. Banister F. Fletcher, jun., A.R.I.B.A., the winner of the Cates prize. The author described in detail most of the principal buildings which went to make up the Exhibition, speaking in appreciative terms of their constructional and decorative treatment. A considerable portion of the paper was devoted to the Palais des Machines, the largest building ever roofed in one span. The structure was jointly designed by M. Dutert, architect, and M. Contamin, engineer. The plan consists of one large nave, 1,380ft. long, and of twenty great principals or trusses springing from the ground, and having a clear span of 375ft., and a height to the ridge of 141ft. 10in. There is no tie-rod at all to the roof, which takes the form of a Tudor arch springing from the ground. There are galleries along each side, continued round the end at a height of 57ft. 6in. from the ground. Each of the foundations to the trusses is able to resist a vertical load of 405 tons 13cwt., and a horizontal thrust of 113 tons. The concrete foundations to the side galleries are connected by stonework arches. The foundations to the main trusses are built in Portland cement, those to the side galleries being in hydraulic lime from Dorking to two of lime to five of sand. The twenty principal trusses are of wrought iron, and are bound together by five deep purlins on each side of the central articulation, the highest on each side being placed near together and carrying the exterior examining platform. The purlins are framed in the thickness of the trusses, and have resting on them, to the number of three between each truss, the principal rafters, which carry the secondary purlins, supporting the secondary rafters which carry the glass roofing. The side galleries are covered with a segmental roof to each bay. The articulations of the great trusses are three in number, one at the crown of the arch and one at the springing at each half-truss, which rest on a roller-plate of cast iron, that is fitted into the cast-iron shoe, which in itself is bolted through to the stone foundation by tie-rods. The strains are taken right through the centre of the cast-iron roller plate. The weight of each truss is 196 tons, and the thrust on each articulation at the base 115 tons. The point of support of each roller plate at the base of the truss is about 7½sq.ft., therefore the total weight of ironwork (7,400 tons) rests on a cast-iron surface of only 300sq.ft., or nearly 25 tons to a square foot. The trusses are composed of two parallel girders, with top and bottom webs, joined by angle irons. The roofing contains 631,857sq.ft. The upper part is covered with glass ⅛in. thick, and the remainder with zinc, laid in rolls on the main roof, and in squares on the side aisles. Mr. Fletcher next described the Palais des Expositions Diverses and the great Central Dome, both designed by M. Bouvard, and spoke of the latter as a marvel of polychromatic decoration. The Palais des Beaux Arts, and its vestibule, the Galerie Rapp, for both of which M. Formigé was the architect and M. Contamin the engineer, were referred to as examples of the application of iron and terracotta in which the ironwork was everywhere visible, the terracotta not being used constructionally. The Palais des Arts Liberaux, by the same architect and engineer, was similar in principle, but the details were worked out differently, the two domes being quite diverse and both satisfactory; they lacked the boldness of M. Bouvard's Central Dome, but were more graceful in detail and outline. The numerous foreign pavilions in the grounds were described and illustrated, that for the Argentine Republic, designed by M. Albert Ballu, jun., being referred to as the most original in the Exposition. It consists of a central dome, with four smaller ones grouped around, and on each side of this central feature extends a wing with central nave and aisles. This is in two floors. The pavilion has a framework of iron, and the materials used for filling in are terracotta, faïence, glazed tiles, and coloured glass as bull's-eyes. The building itself is put together in its larger parts by the aid of bolts and screws, as it is the intention of the Argentine Republic to have it re-erected in Buenos Ayres. The "habitations of man in all ages," by M. Charles Garnier, on the Quai d'Orsay, was referred to in appreciative terms, and the author, like most visitors to the Exposition, was agreeably disappointed in the Eiffel Tower, which is saved from failure artistically by its open lace-like structure, causing it to crush nothing and dwarf nothing. In conclusion, Mr. Fletcher devoted some attention to the collection of architectural drawings, than which he considered no finer or more representative collection had ever been brought together. Colour is, he remarked, the exception in the architectural drawings by English students. One sees comparatively few fresh drawings of old French work in the Exhibition, and even these are all executed with colour. Another great point is the size of the French designs, and the absence of perspective which one meets in French work. The scale usually employed is two centimètres to the mètre, or $\frac{2}{100}$, which is practically equal to over ¼in. scale to the foot, and for details five centimètres to the mètre, or $\frac{5}{100}$ full size, half full size also being used, and in all these details the shadows are carefully shown. The importance of the plan in comparison with the elevation is emphasised. The system of shadows and the absence of perspective naturally go together; one is not so much wanted where the other is employed. But it is this respect of shadow throwing which accounts to a large extent for the other differences as to scale, composition, &c. Yet another point is the more complete study of

the figure by French architects. Both of these differences are brought about by the early training. Then, again, one notices the absence of new domestic work at the Exposition, and what is there is bad. French country houses are designed on the "square and high" principle instead of in the "long and low." From the study of the French system, then, he considered that it worked admirably for public buildings with large façades (especially when aided by plaster models of the building to a large scale), and also for the preparation of details, but that for the designing of country residences the English and American perspective system was to be preferred.

At the close a vote of thanks was passed to Mr. Fletcher, on the motion of Mr. R. Phené Spiers, F.S.A., seconded by Mr. Hampden W. Pratt, and supported by Mr. F. R. Farrow (who read a letter from Mr. Arthur Cates, the donor of the prize, expressing regret at his inability through illness to be present, and expressing great satisfaction with the work accomplished by Mr. Fletcher), Mr. Francis Hooper, Mr. Wilfrid Stokes, A.M.Inst.C.E., Mr. A. O. Collard, and the President; and letters of thanks were also directed to be forwarded on behalf of the Association to the Parisian architects who had assisted the lecturer.

APPLIED MECHANICS FOR ARCHITECTURAL STUDENTS.—II.

9. THE "parallelogram of forces" can be applied to the determination of the strains in the various parts of any piece of framing, such, for example, as the roof-truss shown by Fig. 5, where A B and A C are the principal

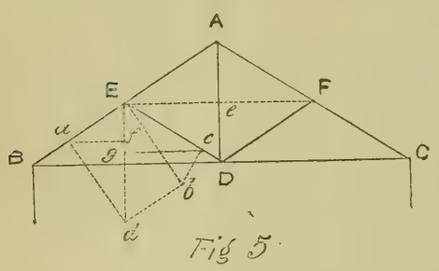


Fig 5.

rafters, A D the king-post, B C the tie-beam, D E and D F struts from the foot of the king-post to the centre of the rafters. The roof-covering may be considered as supported at A, B, C, E, and F by means of purlins fixed to the principals at those points, and producing vertical pressures thereon. Then if W is the load on *each* side of the roof, we will suppose that half W is supported

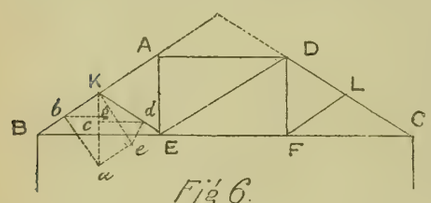
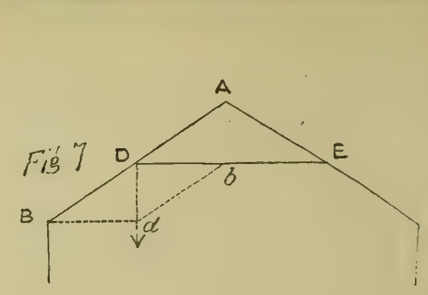
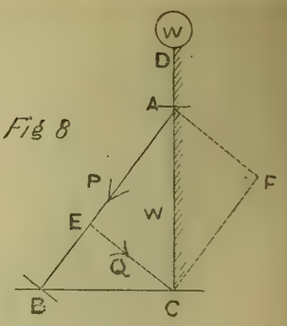


Fig 6.

at A, E, and F respectively; and one fourth W at B and at C. The struts D E and D F are here drawn parallel respectively to A C and A B. Take the length of the king-post A D to represent the load at A, or one-half of W. Then, as before shown in Fig. 3, A E and A F represent the thrust down the rafters as far as E and F. If we draw the horizontal line E F cutting A D in *e*, then E *e* will represent the horizontal thrust on the foot of the rafter B, produced by the load at A, while A *e* is the vertical pressure at B from the same load. We have now to consider the strains produced by the load half W at E, which we will represent by the line E *d*; and, in the first place, we will suppose that there is no strut at E. Then the vertical pressure at E will cause a compression down the rafter E B, and also a transverse strain at right-angles to it, so that if we draw the rectangle E *a d b*, making E *b* and *a d* perpendicular to E B, and *b d* parallel to E B; then E *b* represents the transverse strain on the beam at E, and E *a* the





pressure down the rafter. The object of the strut D E is to take the transverse strain off the rafter at E; then if D E is not at right angles to A B, we must draw *b e* perpendicular to D E, and E *e* will represent the thrust down the strut, while *b e* will represent a transverse strain at right angles to it. Draw the horizontal lines *a f* and *c g*; then *a f* represents the horizontal thrust produced by the load at E upon the foot of the rafter, and the total tensile strain in the tie-beam will be represented by E *e* + *a f*. The line *c g* represents the horizontal pressure of the strut D E at D, which is counteracted by a similar one from the strut D F. The line E *g* will be the vertical strain on the king-post, caused by the load at E, so that twice E *g*, together with half the weight of the tie-beam B C, will represent the total tensile strain in the king-post. The total compressive strain down each rafter, A B or A C, will be represented by the length A *a*. These lines are all to be measured on the same scale as that on which A D represents half W.

10. The various strains in a "queen-post" truss can be determined in a similar manner. Let A B and D C (Fig. 6) be the rafters of such a frame, A D the straining-beam, B C the tie-beam, E K and F L the struts. Then, if W is the load on *each* side of the truss, we may suppose that half W is supported at A or D, one-third W at K and at L, and one-sixth W at B and C. Let the line A E represent the load half W, sustained at A, which will produce a strain along A D, and also down the rafter A B; and if we draw E D parallel to A B, then A D represents the compression in the straining beam, and A B that in the rafter as far as K; the line B E will represent the horizontal thrust at B caused by the load at A. We have next to consider the effect of the load, one-third W, acting at K, which we suppose to be represented by K *a*. Then, as in the former example (Fig. 5), we draw the rectangle K *b a e*, making K *e* and *b a* perpendicular to K B, and *a e* parallel to it. Then K *b* represents the thrust down K B from the load at K, K *e* the transverse strain at right angles to K B. The horizontal line *b f* will represent the horizontal thrust at B caused by the load at K. Drawing the horizontal line *d c*, this will represent the horizontal thrust at E, which is counteracted by a similar one at F. K *c* represents the vertical strain down the queen-post A E, caused by the load at K, to which must be added one-third of the weight of the tie-beam. The total pressure down A B is represented by A B + K *b*, and the total tensile strain in the tie-beam by B E + *b f*.

11. Another common form of roof where the span is moderate is that known as the "collar-beam" roof, the outline of which is shown by Fig. 7, where A B and A C are the principal rafters, D E being the *collar* placed half-way up the rafters, the feet of which rest upon supports at C and B. Taking W as the weight of the roof-covering on each side of the truss, and borne by purlins at A, D, B, E, and F, the purlin at D will have to bear one-half of the load W; but there will be the additional weight of the upper part A D E to be sustained by D and E, making altogether three-fourths of W acting vertically at D. The collar D E prevents any outward horizontal thrust at D and E; but the load at D and E will cause an outward thrust on the supports at B and C, which they must be made strong enough to resist, otherwise the feet of the rafters will spread and push out the supports. Let D *a* represent on scale three-fourths of W, and draw *a b* parallel to B D, B *a* parallel to D E. Then D B and D *b* will represent on the same scale the *components* of the load at D; D *b* or B *a* representing the horizontal thrust at B, and D B the compression down the rafter. The higher the angle of pitch of the roof, the less will be the horizontal thrust at B.

12. Another application of the "parallelogram of forces" can be made to the case of a *raking-shore* fixed against a wall in order to support or strengthen it. Let D A C (Fig. 8) be an upright wall, against which the shore A B is firmly fixed by means of a *needle* driven into the wall at A, and being let securely into a template on the ground at B. The shore is really kept in its place by the weight W of the wall A D above its top, for if there is any tendency to push the shore over at A, it is only the load W that can prevent it. Suppose the length A C to represent the weight W of the wall A D, draw the line C F parallel to A B, and draw A F and C E at right angles to A B. Then A C is the diagonal of the parallelogram A E C F, and consequently A E and A F or E C represent the *components* P and Q of the force W, the former in the direction of the shore and the latter at right angles to it. The force P gives the compression down the shore, and the force Q gives the transverse strain to which it is subjected, from which we can determine the scantling that it is necessary to give the shore. (For a full discussion of "The Mechanics of Shoring," the reader is referred to the BUILDING NEWS for September 14, 1877.)

13. The ordinary *cantalever* or *bracket*, so commonly used in architecture, affords another example for the application of the "parallelogram

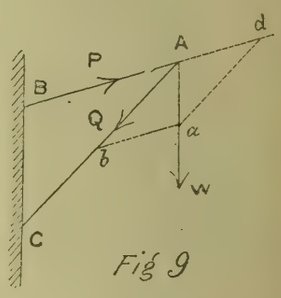


Fig 9.

of forces." Let B C (Fig. 9) represent the face of an upright wall, against which the beams A B and A C are fixed, being securely framed together at A. Let W be the load which this frame has to support at A; then to find the strains produced by the load on A B and A C, take A *a* to represent W, and draw *a d* parallel to A C, *a b* parallel to A B. Then A *a* is the diagonal of the parallelogram A *b a d*, and A *d* and A *b* are the *components* of W; consequently A *d* or *a b* represents the force P in A B acting in the direction from B to A, and A *b* or *a d* the force Q in A C in the direction from A to C. We see, therefore, that the beam A B is subjected to a tensile strain, while A C has to support a compressive strain. It is also evident from geometry that the three forces W, P, and Q are proportional to the lines C B, B A, and A C, since the triangles A B C and A *a b* are similar. The load W causes a contrary strain equal to P in A B and to Q in C A, acting from A towards B and from C towards A, so that the sides of the triangle A *a*, *a b*, *b* A, taken in order, form the "triangle of forces" in equilibrium. Since A B is wholly in *tension*, it may be formed of a rod of iron, a chain, or a rope. ("The Mechanics of Brackets" will be found to be thoroughly investigated in the BUILDING NEWS for Nov. 5, 1880.)

14. When a force, such as the thrust of a rafter, acts obliquely on the top of a wall or other support, it tends to overturn the support unless

its weight is sufficient to resist the thrust, and the resultant of the thrust and of the weight of the support must fall within the thickness of the support. Suppose the thrust P (Fig. 10) to act

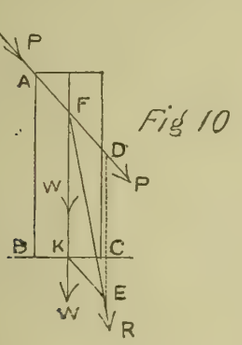


Fig 10

obliquely on the top of the wall A B C, and let W be the weight of the wall acting down the middle of its section. Let the direction of P intersect that of W at F, and let F K represent the weight W of the wall, F D the thrust P. Draw the parallelogram F D E K, then the diagonal F E will represent the resultant R of P and W, both in direction and magnitude. If the line F E falls within the base B C of the wall, it will be stable; but if it falls outside the point C, the wall will be overturned. We can thus determine what thickness or weight must be given to the wall in order to make it safe.

THE LATE SIR MORTON PETO.

SIR SAMUEL MORTON PETO, Bart., who died on the 13th inst. at Tunbridge Wells, aged four score years, will be remembered as having been a quarter of a century ago the most famous of living contractors. On attaining his fourteenth year he was apprenticed to his uncle, Mr. Henry Peto. who carried on a large building business. During his apprenticeship the youth acquired a knowledge of architecture, surveying, and drawing, and displayed a great aptitude for the business of a civil engineer. In September, 1830, Mr. Henry Peto died, leaving his whole business to his two nephews, Mr. Thomas Grissell and Sir—then Mr.—Samuel Morton Peto. They remained in partnership for sixteen years, during which time they carried out many very important works, including the regulation and improvement of the Severn navigation, and part of the Great Western Railway. They also built the station at Curzon-street, Birmingham, then the terminus of the London and North-Western Railway, and the only station in that city. In London the firm erected a number of important club houses, the Lyceum and St. James's Theatres, Hungerford Market, the Nelson Column, and the Houses of Parliament. After the partnership was dissolved in 1846, Sir Morton carried out alone a number of important railway contracts. After some years he again entered into partnership, this time with Mr. E. L. Betts, his brother-in-law, and among the principal works carried out by the new firm were the Great Northern loop-line from Peterborough to Doncaster; the Oxford, Worcester, and Wolverhampton line; and the Oxford and Birmingham line, on which is the largest cutting in England—viz., 1,500,000c.yds. They also constructed several foreign lines; and in association with Mr. Brassey, the firm made the Australian lines, and the Grand Trunk of Canada, with the Victoria Bridge over the St. Lawrence. They also constructed the Victoria Docks and the Thames Graving Docks. In later years, Sir Morton went into partnership with Mr. Crampton, and together they carried out the contract for the London, Chatham, and Dover Railway, including the two bridges at Blackfriars and Victoria over the Thames. In the scheme for the Great Exhibition of 1851, and when the Prince Consort found great financial difficulties in the way of carrying out his plan, Sir Morton voluntarily offered to become personally responsible to the extent of £50,000. His offer formed the nucleus of the guarantee fund which tended to the general security of the whole undertaking. When in 1854 the British troops in the Crimea were reduced to great straits through the difficulty of transporting provisions and materials of war from the harbour of Balaclava, the idea occurred to Sir Morton of making a railway to relieve the men of their exhausting labour. His offer to carry out this work was gladly accepted by the Duke of Newcastle, then Minister for War, and in all some forty miles of line were laid. This was the first application of railways to uses of troops in war. The whole of the works were carried out at cost price, and no profit was made out of the Government in any way. In acknowledgment of this Sir Morton was created a baronet. Since his failure twenty years ago, owing to the suspension of the London, Chatham, and Dover Railway Company, the sensation of which all the commercial world still remembers, he has lived in absolute seclusion on the ample private fortune of his second wife, who survives him.

SWISS ARCHITECTS' CHARGES.

THE Swiss architects and engineers have established a schedule of charges which compares with the German tariff. Three classes of structures are distinguished: the first class comprises rural buildings, factories, warehouses, workmen's barracks, and simple school buildings; the second class, dwelling houses, hotels, boarding-houses, public establishments, railway stations, &c.; the third class comprises interior and exterior decoration, furniture, monuments, fountains, and other ornamental and monumental structures of this class. For the design and superintendence of the first class of buildings architects can charge a commission varying from 5 per cent., where the cost is from 10,000fr. to 25,000fr. (or about £417 to £1,042), to 3½ per cent., where the cost exceeds 500,000fr. (£24,166). This practically is at the rate of 5 per cent. for all constructions of this class costing over £417. For the second class of structures the commission varies from 6 per cent. for those costing between 10,000fr. and 25,000fr. to 4½ per cent. where the cost exceeds 500,000fr. Decoration of houses is not included in this charge. In the third class the commission varies from 6 per cent. where the cost is more than 500,000fr. to 10 per cent. where it is between 10,000fr. and 25,000fr.

Clerks of works, when necessary, are to be paid by the client; where not employed the client is to pay for measuring up the work, for verifying the builder's accounts, and other like services. Architects' travelling expenses are to be paid, also a compensation for absence from office of one guinea for each half-day, or £1 5s. for a whole day. The commission for work costing less than 10,000fr. in any class is to be fixed by special agreement.

The Glasgow town council have received a communication from the Merchants' House, offering to make over on certain conditions to the corporation the Bridgegate Steeple. The property of this interesting memorial of the former location and early history of the House was reserved, when the remainder of the Merchants' House buildings, erected in 1659 from designs by Sir William Bruce, was sold in 1819. Considerable outlay was now necessary for the due preservation of the structure. A committee recommended the council to decline the offer; but after discussion the matter was continued for further consideration.

On Thursday, the 14th inst., new Church of England Schools, erected at South Clevedon, Somerset, were opened. The accommodation includes a main schoolroom, 74ft. 3in. long by 20ft. broad and 18ft. in height, which will accommodate 160 scholars, and a classroom 20ft. square; boys' entrance lobby and cloak-room and the existing girls' and infants' cloak-rooms have been enlarged. On the chief elevation, a plinth of the local Pennant stone is surmounted by Cattybrook face bricks, and the dressings are of buff terracotta, supplied by the Bristol Fireclay Company. The gables are of half-timber construction, the carved panels surrounding the circular windows being executed by Mr. J. P. Steele, of Kingsdown-parade, Bristol. The whole of the works have been carried out, at a cost of about £1,100, from the designs of the architects, Messrs. Drake and Bryan, of Unity-street, Bristol, by Mr. H. A. Forse, contractor, and Mr. Henry Taylor, of Clevedon, has acted as clerk of the works.

New printing works at Frome have been erected for Messrs. Butler and Tanner, and special attention has been paid to the ventilation, the extraction of the vitiated air being effected by Messrs. Robert Boyle and Son's latest improved patent self-acting air-pump ventilators.

COMPETITIONS.

BROMLEY.—In a limited competition for the Aylesbury-road schools, for the Bromley School Board, Kent, Mr. R. N. Shaw, R.A., acting as referee, has placed the plans submitted by Mr. John Ladds, architect, of 4, Chapel-street, Bedford-row, first in order of merit, and the board at once unanimously appointed him architect to carry out the work.

CHIPS.

The local board of Smethwick adopted, on Friday, plans by Mr. A. Harris, of Birmingham, for two chapels, to be placed side by side, and two mortuaries and vestries, proposed to be erected in the cemetery.

An adjourned meeting of the Registration Committee of the District Council for West Lancashire, Cheshire, and North Wales in connection with the Worshipful Company of Plumbers was held on the 14th inst., at the Free Library, William Brown-street, Liverpool, and Dr. Stopford Taylor, medical officer for that city, presided. The honorary secretary, Mr. Watkin Hall, C.E., reported that there were over 70 students attending the classes of instruction in theoretical and practical plumbing. He also explained steps that had been taken to prevent the use of the term "registered plumber" by persons not entitled thereto, or by firms so using the title as to mislead the public.

One of the original mosaics of the façade of the Duomo of Orvieto, by Orcagna, has been discovered in the shop of a dealer in antiquities in Rome. It had been removed to make room for a more modern substitute.

The Kettering local board, on the 13th inst., had before them for selection of surveyor for the district, in succession to Mr. J. Alfred Gotch, F.R.I.B.A., resigned, the following gentlemen:—Mr. W. T. Fairley, Assoc.M.I.C.E., city surveyor's office, Edinburgh; Mr. T. W. Franks, assistant surveyor, West Bromwich; and Mr. S. E. Burgess, assistant surveyor, Stockton-on-Tees. The former was elected. There were fifty-eight applications.

The new Hawarden Railway Bridge over the Dee, connecting the Manchester, Sheffield, and Lincolnshire Railway system with North and South Wales, was officially tested and inspected on Friday by Major-General Hutchinson on behalf of the Board of Trade. The inspecting party included the contractors, Messrs. John Cochrane and Sons, the engineer, Mr. Francis Fox, and the resident engineer, Mr. S. B. Cottrell.

A fire broke out on Sunday on premises occupied by Messrs. Brown and M'Neil, cabinet-makers, Surrey-street, Glasgow. A building of four stories, with frontage of 100ft., was gutted. The damage is estimated at £7,000.

The new chancel of St. Hilda's (R.C.) Church, Middlesbrough, was opened on the 14th inst. by the Bishop of Beverley. Early this year the chimney of the vestry and heating apparatus were blown down in a gale of wind, and crashed through the roof of the chancel, demolishing it, and also injuring the organ. In rebuilding the chancel its length has been increased by 12ft., making it 26ft. 8in. long. The cost of the restoration has been over £700. Mr. W. H. Blessley was the architect, and Mr. John Johnson the builder.

At a special meeting of the governors of the Cardiff Infirmary, held on Thursday, the 14th inst., the report of the committee upon the extension of the building was adopted. The committee considered it necessary to provide a new block to contain 60 beds for ophthalmic and aural cases, and also enlarge the present administrative block to provide 20 additional beds for nurses. The cost of these extensions was estimated at £8,000.

A stained-glass window has been fixed in Wrockwardine Wood Church, Salop, which is now reopened after restoration. The subject of the window is an illustration of the text "I was sick and ye visited me." The work has been executed by Mr. W Pearce, Bridge-street, Birmingham.

We have been informed that Mr. W. E. Axon has been appointed clerk of works at the Palace of Varieties, Manchester, now being erected from the designs of Messrs. Darbyshire and Smith, architects, Manchester. Mr. Axon held a similar appointment at the Theatre Royal, Exeter, under the same architects. At the completion of the theatre the directors presented him with a gold watch as a mark of esteem and appreciation in connection with the rebuilding of this theatre, which our readers will remember was burnt down some little time ago.

The second section of the work of restoring the parish church of Rotherfield, East Sussex, from plans by Messrs. Medland and Powell, is about to be commenced. It will include all external repairs, and the provision of heating apparatus. Messrs. Moon, who carried out the first section of the works, are the contractors.

WAYSIDE NOTES.

IT was well for the credit of the London County Council that the matter of electing an engineer in the place of the late Mr. Joseph Gordon was referred to committee for consideration. To have then and there installed Mr. F. E. Duckham, or any of the gentlemen whose names were brought forward at the Council's meeting on Tuesday last, in the post, would have been thus early to have created a suspicion in the public mind of that well-hated jobbery for which the past M.B.W. earned renown. Competent and desirable officials as either of the three engineers would doubtless have proved, it is in every way best that there should be a fresh election, preceded by an advertisement. What the Council's committee may recommend remains to be seen. The Council itself has wisely decided to refer the matter, and thus far so good. It gives the councillors time to reflect upon the dangers attendant upon the adoption of the report of the first committee. They may rest assured that such a course would have caused them to come down, with a run, in the estimation of the public; and, having thus narrowly escaped one danger in the path, they should pick their way cautiously in future considerations of the question. This, it seems to me, would be best done by a new election from a number of candidates. If, as the Earl of Rosebery said, time is the essence of the matter, then let an engineer be appointed *pro tem.* But to hastily fill a permanent post for this reason would be against all just principles.

"Who is going to stir up the County Council about their ways of accepting tenders?" said a friend the other day, insinuating, doubtless, that I should do the dirty work. Well, it does appear about time something was spoken in the matter. On Tuesday, I see, the Council accepted a tender for the execution of works for the extension of the pauper Lunatic Asylum at Cane Hill, Coulsden, the said tender, according to a statement made by Mr. Councillor Moss, being £5,000 above the lowest. And, I understand, this proceeding bears no comparison with that attendant upon the tendering for the new asylum at Claybury, in Essex. The point is, Can the County Council, by insinuating a drop of Socialism into the existing ocean of Competition, add to the welfare of the nation, or does not the attempt to do so, whilst benefiting a few, do injury to the community at large? This should be an interesting question for contractors, who may well ask why the County Council have tenders at all; and also a subject for thought among honest British workmen who can look at matters broadly and in a Catholic and receptive spirit.

Coincident with the publication of the report of the County Council's proposal to purchase, if possible, eight acres of the twenty-three comprised in the site of Millbank Prison—a proposition which has the effect of "two bites at a cherry"—for the erection of artisans dwellings, comes the news that Sir Edward Guinness has placed in the hands of a committee of gentlemen the sum of a quarter of a million sterling for the purposes of erecting similar buildings; only Sir Edward's princely gift has for its aim the solution of a very interesting problem. It is generally known that the artisans' dwellings hitherto erected, either by the Peabody trustees, by other beneficent and philanthropic institutions, or by private enterprise, are widely inhabited by classes far above those for whom it was intended to provide. Clerks and well-paid mechanics and artisans dwell in the hitherto erected artisans' dwellings, whereas it is the poorest of the poor that should be benefited by such buildings. They, however, still inhabit the slums and remaining unsavoury rookeries of London, whilst those who could afford to pay higher rents crowd into the blocks of "dwellings." It is Sir Edward Guinness's object to endeavour to solve the problem of housing the really poor. The sum of money he places in the hands of Lord Rowton, Mr. Ritchie, and Mr. Plunket is to be devoted to the solution, or attempts at the solution, of this problem. All will sincerely hope that the efforts will be crowned with success, and that rooms and apartments, letting at the lowest possible rentals, can be so constructed as to prove that clean and healthy homes may be provided for the class in question, and on a sound financial basis.

How the problem is to be attacked is not yet known, or, at any rate, it is not made known to the public. That it is a difficult one, liable to have attempts at its solution frustrated by side issues—such, for example, as the crowding of classes not wanted into the tenements—past experience has abundantly shown. I would humbly suggest to the trustees of the fund of Sir Edward Guinness that they inaugurate such a well-arranged, well-paid competition among architects as will call forth the most matured thought upon the subject within our ranks. To *appoint* an architect will simply be turning the whole matter into a farce, and squandering the money so liberally given by Sir Edward.

To-day those so inclined may apply for particulars of the competition inaugurated by the Committee of Visitors of the Dorset County Lunatic Asylum. The committee are desirous of effecting alterations and additions to the existing asylums at Charminster, and offer premiums of £40 and £20 for best designs, plans to be sent in before January 21st next.

Those who would like to see that the discussion on St. Alban's Abbey has been attended with results that are of permanent benefit should read the correspondence which has been carried on in the columns of the *Times* anent the condition of Selby Abbey. In a letter from Mr. Poynter, R.A., published on Saturday last, that artist draws attention to the lavishing of large sums of money on the "desecration" of St. Alban's, and expresses a hope that no sort of "restoration" of the kind to be found at the Hertfordshire abbey will be carried out at Selby. This is very encouraging. A few more letters of this nature from men of Mr. Poynter's standing would go far towards effecting our long-desired object of educating the public on this question of restoration in general, and that of St. Alban's in particular. I was sorry to see a letter from Mr. Cavendish Bentinck, insinuating that because Mr. Poynter complained of the treatment of St. Alban's, and said nothing about the new altar-screen at St. Paul's, that therefore he did not know what desecration was. We may many of us think that the reredos in question, intrinsically beautiful as it may be, would have been much better placed as a curiosity in a museum; but to argue as Mr. Cavendish Bentinck does is simply ridiculous. The latter gentleman might observe that there is all the difference in the world between absolute wanton desecration, such as at St. Alban's, and mere intrusion and obstruction as at St. Paul's.

The noble Abbey of Selby is worthy of painstaking and careful reparation, such as I understand is the intention of the Rev. A. G. Tweddie, the vicar. All who are acquainted with the old Yorkshire Minster speak of it in the highest terms as one of the most beautiful of the many beautiful Yorkshire abbeys. Unfortunately (?) for posterity, Selby is the only one in the great county of England that has been kept from a state of more or less confirmed ruination. It owes its preservation to the fact, noticed in William Grainge's "Castles and Abbeys of Yorkshire," that, at the dissolution of the monastery, the *abbey* church became the *parish* church. Thus it came about that, great as may be the present need of repair, the building has been kept in condition where other abbeys have fallen arch by arch—as Gothic buildings do fall—and become thickly ivy-mantled. "What a pity," says Grainge, in a footnote to his work above-mentioned—"what a pity that a few more of the splendid abbey churches were not made parochial." Perhaps so; but one hardly feels this sort of sentiment with regard to beautiful Fountains Abbey, Tintern, Netley, or any of the many other lovely ruins that gem the country side of old England. There is something about the beauty of a ruined work of true architecture that gives it a value to the architect equal to a dozen old buildings in good repair, and to a hundred that have been thoroughly restored.

In 1743, I learn, the west front of Selby Abbey was "cleaned and repaired," and in 1828 the approaches were cleared, and the churchyard inclosed with iron pailings at a cost of £600. What has happened at Selby of late years I know not; but from the accounts of the *Times* correspondents, it appears to have get into a bad condition, and that rapidly, for in the middle of the present century it is stated to have been in excellent repair. Happily, the vicar seems thoroughly imbued with a sense of his duty to effect only such works as will render the building sound and fit for worship; and, I believe, unless overridden by others, no attempt will be made at any kind of fanciful restoration. This is well, for we have grown sick of the restoration of abbey churches, the mention of the process in connection with the thing to be operated upon being as a red rag to a bull, and causing the architect to bristle out like a hedgehog, until all danger of adoption of Grimthorpean restoration principles be gone by.

Selby was one of the abbeys founded by the Conqueror, the date accepted being 1069, and, taken *en bloc*, may be said to consist of a massive Norman nave, contrasting with a delicate "Dec." choir. It may cause many to chew the cud of reflection to know that William, being unusually well-disposed towards this abbey, among other benefits granted the monks a court, with "*sac, soc, team,* and *infangtheof.*" The fraternity were grateful, as may be supposed. The monks of Selby had a rare old time of it at a certain period of their history, it would appear. Abbot Thomas de Whately was a rollicking divine, and a good type of the most undesirable members of Mediæval church brotherhoods. He seems to have generally led a life at once remarkable for its activity in vice and sloth in religious duties. The Archbishop of York, however, caught him red-handed at his tricks, and the year 1280 saw him deposed, to the benefit, doubtless, of the manners and morals of the monks of the Abbey, and the weal of the unreformed church.

GOTH.

CHIPS.

New Congregational schools were opened on Monday at Broughton, Manchester. They comprise assembly-room, around which are grouped a large number of class and other rooms, together with an infants' schoolroom. The assembly-room seats from 500 to 600 persons, and at one end is an arched recess, with platform. It is lighted by stained-glass windows, and by a clerestory in the roof, which is open-timbered. All the rooms are heated by hot water. The exterior is of old English character, with a tower and spire at the corner of Teneriffe and Ramsgate streets. The works have been carried out by Messrs. W. Southern and Sons, from the designs of Mr. W. S. Ogden, Spring-gardens, Manchester.

The new road bridge over the Tummel at Ballinluig was formally opened on Friday. The bridge was subjected to inspection and test by Mr. Alexander D. Stewart, C.E., London, on behalf of the promoters, and Mr. William Bell, C.E., road surveyor, for the Road Trustees.

At a vestry meeting held at All Saints', Hereford, last week, a committee was formed for the restoration of the church, and was instructed to correspond with Mr. J. Oldrid Scott, F.S.A., with a view to executing the plans prepared by the late Sir Gilbert Scott thirteen years ago.

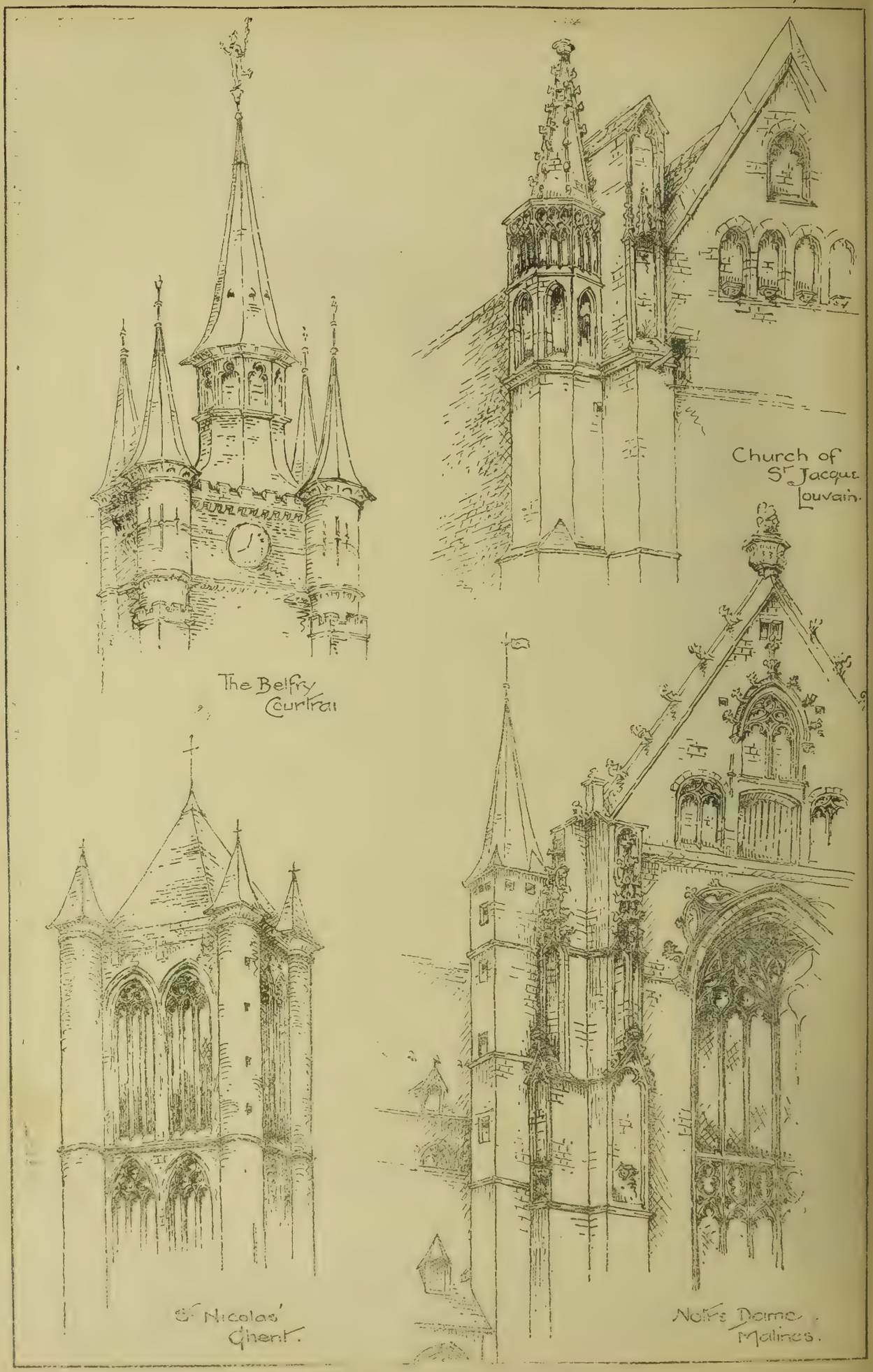
The parish church of Copmanthorpe, which has been restored at a cost of £500, was reopened on Tuesday week by the Archbishop of York.

On Thursday, the 14th inst., a window which has been placed in the chancel of the church at Wetley Rocks, Salop, as a memorial, was dedicated by the Bishop of Shrewsbury. The centre light is occupied with the figure of Christ on the cross, the Virgin Mary lying at his feet. The side lights are filled in with figures of the Apostles in the lower part, whilst above them are bands of the angles who, "beholding, wept." The window was designed and executed by Mr. A. O. Hemmings.

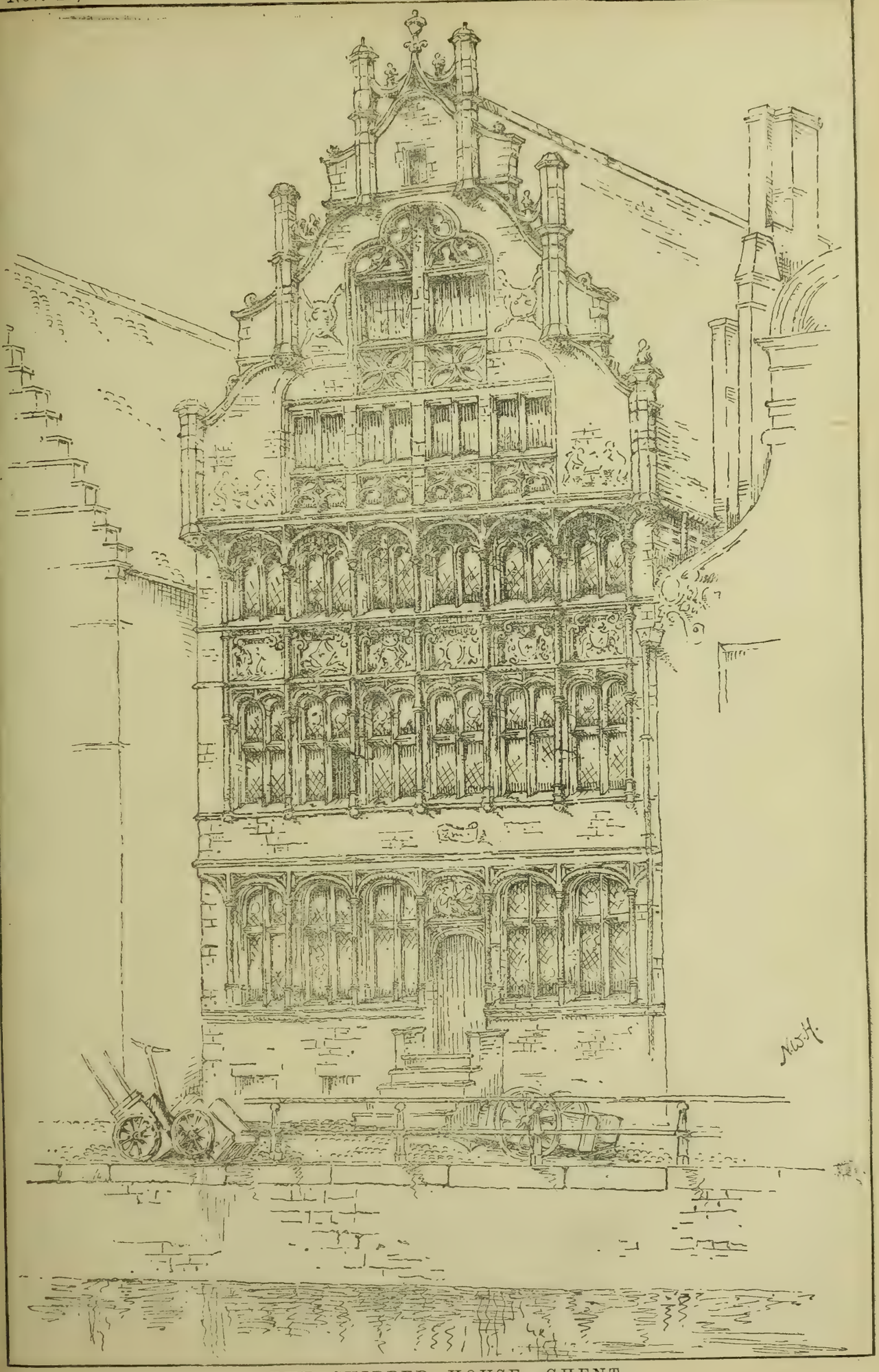
The monument raised in honour of the great military painter, Alphonse de Neuville, on the Place Wagram, Paris, was inaugurated on Sunday. The statue, which is in bronze, represents the painter leaning almost in a sitting posture on the trunk of a tree, holding in one hand a brush and in the other a palette.

The captains of the G and K corps of the 1st Manchester Volunteer Regiment have submitted plans to the Eccles local board for the erection of a Volunteer drill-hall in Cromwell-road, Patricroft. The building will provide accommodation for about 200 men, and in the front portion there will be a reading-room and armoury. The plans have been prepared by Mr. G. H. Hunt, of Manchester, and the estimated cost is £2,000.

A statue representing the Good Shepherd has been placed in the niche at the east end of the exterior of Christ Church, Wolverhampton. The figure is made of Portland stone, and was executed by Mr. Catlay, of London, under the supervision of Mr. T. H. Fleeming, of Wolverhampton.



SKETCHES FROM BELGIUM.



THE SKIPPER HOUSE, GHENT.

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ILLUSTRATIONS.

LORD GRIMTHORPE'S OWN DESIGN FOR THE WEST FRONT OF ST. ALBAN'S.—THE BECKETT CRUCIFIX.—HOUSE NEAR SHEFFIELD. — YORK MINSTER. — NEW ORGAN CASE, CHICHESTER CATHEDRAL.—THE DINING HALL OF THE CHARTERHOUSE, E.C.—THE TOWER, CLIFTON COLLEGE. SKETCHES FROM BELGIUM.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ST. ALBAN'S ABBEY*: LORD GRIMTHORPE'S OWN DRAWINGS.

These reproductions are photo-lithographic copies of the original drawings made by Lord Grimthorpe, showing his design for the west front, since executed with variations, under the direction of the late Mr. Chapple, and his proposal for the treatment of the original crucifix space in the ancient screen over the high altar of the Cathedral. The trial of Mr. Henry Hucks Gibbs v. Lord Grimthorpe, resumed last Saturday in the Law Courts and reported in the Building News to-day (page 718), has directed public attention to the questions in dispute with regard to the work which Lord Grimthorpe has carried out in rebuilding this great national monument. Our readers have had the matter fully placed before them by the recent continued correspondence in our columns, while the only illustrations ever published in a professional journal of the new west front, north transept, south aisle buttresses, and other parts of the reconstruction now in progress, or lately completed, have appeared in our pages. The working elevation of the new west façade was given, with plans, on Nov. 26, 1880, and a sketch, made on the spot, of the front as built was published by us on July 17, 1885. We now complete the matter by reproducing Lord Grimthorpe's own drawing of St. Alban's west front. This is delineated to the scale of one eighth of an inch to the foot, and so our photographic copy is about half-size, or rather larger, and, of course, is in fac-simile. The note on the drawing is a memo. of some interest, and runs:—"Sir E. Beckett's design of Sept., 1879, with more details, which he means to follow, subject to any variation of details which may be found expedient. These outlines will be adhered to, and the two stories of arcades. Copy sent to Bishop 24 Nov.; sent to Chapple (clerk of works at St. A.) 26 Nov.; laid before committee with the above conditions written thereon 5 Dec., '79, and before the Rector and Churchwardens soon after." In lieu of the tracery to the great west window occur the words: "Details omitted, and their condition uncertain. Scott's estimate for repairs £200, ex. glass." Over the central portal is inscribed—"These porches are no part of the present design, being left for the Freemasons, and are only sketched provisionally." The "Beckett Crucifix," as it has been called, shows Lord Grimthorpe's design for the treatment of the space in the centre of the ancient reredos or screen over the High Altar of St. Alban's Cathedral, and is intended to take the place of the figure of the Saviour on the Cross, which originally existed here. At the base of the Cross, on either side, are statues of St. John and the Virgin, while around and above in the original niches stand a whole series of new full-length figures of saints and angels grouped round the Cross to emphasise the Passion. On this work of renovation Mr. Hucks Gibbs has spent about £10,000 under the direction of Sir Arthur Blomfield, A.R.A., Mr. Harry Hems, of Exeter, being the sculptor. Mr. H. Gibbs, we understand, wishes to complete the work by restoring the cross with a silver statue of Our Lord, in accordance with what was formerly there. Lord Grimthorpe refuses to allow this to be done. The drawing given to-day is his lordship's original design for the same space. The main idea embodied in it seems to be an endeavour to ignore the form of the cross as much as possible by inserting on the main limb three niches, ranging one over the other close together, so as to enforce the vertical line to the utmost, and thus divide the general composition of the screen into two. The flatly-treated bosses of carving on the arms of the cross, being placed under the angel niches above, would help this notion, and serve to minimise the horizontal lines of the rood, while their subjects are somewhat akin to the quaintly-carved rebus of the Mediævalist, only without a corresponding play on words. Here a similar fancy is extended to the cross. Thus we have a cardinal's hat, an imperial crown, two Tudor roses, a regal crown, and then an heraldic shield. For scale the dimensions are figured.

HOUSE NEAR SHEFFIELD.

This house is built of stone to the level of the first floor, and above the walls are covered with cement finished white, the gables being built in half-timber work, and the roof covered with red Staffordshire tiles. Messrs. Bell and Roper were the architects.

YORK MINSTER.

The photographic view of this cathedral, which Sir Walter Scott calls "the most august of temples, the noble Minster of York," gives a general idea of its proportions and vast extent as seen from the south-west, showing in detail at the same time the exquisite west front, which has been frequently "compared to the façade of Rheims Cathedral for richness, sublimity, and beauty of architectural design; it is certainly not surpassed by that of any church in England for its fine proportions, chaste enrichments, or scientific arrangements." The composition is divided into three parts by massive and highly-elaborated buttresses, enriched on every face with tabernacle work; but the niches have lost their statuary. In each of these three divisions there are portals to the church. In the towers are two large windows, one above the other; the two lower ones are Decorated, and the upper ones are of the Perpendicular period, like the lanterns over them. The central portal of this front is divided into two by a central shaft, and over in the spandrel is a circular, six-light, unusual window—making, perhaps, a unique arrangement. Over this is a crocketed gable, in the centre of which is a statue of Archbishop Melton in a niche. He it was who finished the building of the west part of the nave. "Over his head is the finest Gothic window in the world, built, in all probability, by himself, and still beaming with the glowing colours with which he adorned it nearly five hundred and fifty years ago. On either hand is an effigy of a benefactor of the church, the heads of the noble houses of Vavasour and Percy, bearing in their arms the wood and stone which they once gave." Archbishop Romaine began the nave in 1291, and it was finished by Archbishop Melton in 1330. The windows in the aisles are Decorated, and the clerestory, in the same style, is very Late in character. The original stone vaulting remains in the aisles; but the nave roof is of wood painted like stone, and is new since the fire in 1840. Lead for roof-covering was first used at York (669-709) by Archbishop St. Wilfrid when he put a new roof on the decayed church, built there originally by Edwin and Oswald. He also placed glass for the first time in the windows. This saint was one of the five of whom York can boast; the others are St. Paulinus, St. Chad, St. John of Beverley, and St. William. Kent, under the supervision of Lord Burlington, designed the nave floor paving in geometrical patterns about 1736. Archbishop Roger rebuilt the choir (1154-1181) and its crypts, with the archiepiscopal palace to the north of the church, and the chapel of the Holy Sepulchre between the two buildings. The central tower, the largest in England, was built about 1260 by John Romanus, the elder treasurer of the cathedral, who inclosed the Norman piers with clusters of shafts. Archbishop Thoresby, with the help of his friend Walter Skirlaw, afterwards Bishop of Durham, clothed the exterior, and probably had the assistance of William of Wykeham, who was a friend of Thoresby's, and is known to have visited York very frequently. The lantern was made open to the top as at present about 1409, when the bells were removed. The tower is Perpendicular, with a groined roof, and has two fine windows on each face. The great screen inside, and the celebrated "five sisters," are among the wonders of this cathedral, and so is the tomb of Walter de Grey*. He it was who built the south transept at a rather earlier date than the north transept, and both are good examples of the best period of Early English work, and very much alike. The front, seen in our view of the south transept, has a pretty rose window with lancets under it, and this part was restored by the late Geo. Edmund Street, R.A., who removed the grey roof, and substituted a wooden one with emblazoned bosses, and he in other ways also greatly improved the cathedral by his careful work of repair generally. The chapter-house and Archbishop le Zouche's chapel are, of course, well know, while the monumentn, the Lady-chapel, and the crypt, are all exceedingly interesting; but the history of the Minster extends over too long a period, and includes so vast a number of facts and important incidents, to permit of condensation into a few lines. Indeed the overwhelming mass of information renders it no easy task to say a few things about this great national building which shall be generally interesting, and at the same time explicit. Our photograph was taken by Messrs. G. W. Wilson and Co., and is a splendid view, as might be expected from their camera.

CHICHESTER CATHEDRAL ORGAN.

This instrument was originally built by Renatus Harris in 1678, and had but one manual, no pedal, and no reed. It possessed a fine case, with richly illuminated front pipes. In 1725 Byfield added a Choir Organ and a trumpet to the Great, and in 1778 Thomas Knight added a small Saull. Further alterations were made in 1808, 1829, and in 1844. Messrs. Hill and Son provided a more efficient Saull in 1851. Later on the instrument was taken off the choir screen, in order that the latter might be removed, which removal contributed chiefly to the fall of the central tower of the cathedral, besides destroying the internal effect of the church. After the reparation of the building the organ was erected in the north transept, immediately above the stalls, where it has remained; but it was always an eyesore, being without a case, and presenting a generally patched-up and ugly appearance. The old case was destroyed, partly during the various alterations made in the organ, and partly by the fall of the tower. The liberality of an anonymous donor last year enabled the Chapter to add pneumatic action to the organ, and execute various internal improvements, and also provide a new case and gallery of oak. The work was carried out by Messrs. W. Hill and Son, and the case designed by Mr. Arthur G. Hill, M.A., F.S.A. It is in the style of the 15th-century Gothic, and is richly ornamented with tracery and other enrichments, as seen by the illustration. The old decorated pipes of 1678 were carefully retained by Mr. Hill, and new and additional pipes added to suit the case.

* The following illustrations of St. Alban's have appeared in the Building News during recent years:—Plan of abbey, cloister, and close (Rev. Mackenzie E. C. Walcott), Feb. 8, 1878; ground plans of abbey, Feb. 25, 1870, and June 21, 1868; perspectives from south-east (W. H. Lockwood), Sept. 22, 1871 (James Neale, F.S.A.), May 24, 1878; do. from south-west, showing former west front (A. Jaques), Feb. 18, 1870; interior old west porch (A. Jaques), Sept. 16, 1870; new west front (elevation), Nov. 26, 1880 (sketch by M. B. Adams), July 17, 1885; do. (J. O. Scott's design), Dec. 3, 1880 (do., Canon O. Davys's design), Oct. 22, 1880; an unrestored porch on south side (Geo. G. Poston), Sept. 6, 1889; bays, north side of nave (J. Neale), May 17, 1878; doorway in screen in nave (G. Herrington, jun.), July 22, 1870; Duke Humphrey's monument, July 22, 1870; monk's watching loft (sketch by G. G. Wallace), Jan. 11, 1884; the slype, now destroyed, Feb. 23, 1877; carvings in Abbot Ramrigge's chapel (sketch by T. F. Pennington), July 23, 1880; carvings of four periods (J. Neale), Dec. 28, 1877; new stalls for choir, Jan. 16, 1880; reredos and stalls for Lady-chapel, Dec. 10, 1880; new statues on high altar screen, Nov. 19, 1886, and June 28, 1889; Abbot Delamere's brass, Oct. 1, 1886; corbel tables removed by Sir E. Beckett, Nov. 28, Dec. 5 and 12, 1879; sections of former roofs, Dec. 6, 1878, Jan. 3, 1879; and sheet of contrasts, June 7, 1889.

* See Building News, June 5, 1874, for view of this monument, by Mr. H. A. Gribble, and Aug. 18, 1876, as well as May 9, 1884, for measured details. Grenefield's tomb figured in our pages on Sept. 7, 1883.

THE CHARTERHOUSE: DINING-HALL.

The Charterhouse was originally built as a priory for Carthusian monks, hence the name—a corruption of the French word Chartreuse—a Carthusian convent. After its surrender to Henry VIII. it passed through several hands, but was at last bought by Thomas Sutton for £80,000. He founded and richly endowed a hospital, consisting of 80 decayed gentlemen, together with a school for forty-four boys, in addition to officers and servants of the house. The Charterhouse School, at which Thackeray, John Wesley, Addison, Steele, Havelock, &c., received their education, has been transferred to Godalming, whilst the non-academic department still remains in the old buildings. The large hall, which was formerly the monks' refectory, is now used as the dining-hall for the occupants of the building.—Fredk. Wilkinson.

CLIFTON COLLEGE TOWER.

The scheme of building the tower, which will cost some £4,300, has been brought to the point of execution through the munificence of the head master, the Rev. J. M. Wilson, who gave £2,000. the remainder being subscribed by the assistant masters and by "Old Cliftonians. The tower is executed in local red stone, with Bath-stone dressings, and contains on the ground level an open carriageway from the north front to the quadrangle, the roof being of vaulted stone. Above this are, on the first floor, a council-room, to be highly finished with oak-panelled walls, and ornamental plaster ceiling. This fine room, 34ft. by 25ft., is lit at either end by a large mullioned oriel window. On the second floor a classroom for the sixth form, with similar oriels at either end; and on the third floor a museum. The rooms are approached by doors communicating with the older college rooms, and also by spiral stone stairs in the angle turrets. The total height of south-west turret is 100ft. The contractor is Mr. T. R. Lewis, of Clifton Vale, and he has now nearly completed his contract. The joint architects are Messrs. Edward J. Hansom, of Bristol (of Messrs. Dunn and Hansom, Newcastle-on-Tyne), and Frederick Bligh Bond, of Clifton.

SKETCHES FROM BELGIUM.

We give illustrations of a few sketches from Belgium, by Mr. N. W. Harrison, and append the following brief description:

"The Skipper House," Ghent, with its elaborate Flemish façade in stone, is one of a group of most interesting old houses lining the quay of the "Grand Canal." It was erected by the Guild of Watermen in 1531.

The church of St. Nicholas, at Ghent, to which the Tower sketched belongs, was founded in the 10th century; but most of the existing edifice dates from the 15th.

The belfry at Courtrai is a red brick structure with stone bands, the lower portion of the centre spire being tile hung; it rises picturesquely above the houses by which it is surrounded and faces the Hotel-de-Ville.

The quaint turret from the church of St. Jacque, Louvain, and the Late Gothic transept gable from Notre Dame, Malines, are interesting "bits."

The death is announced of Mr. Frederick Davison, of the well-known firm of organ-builders, Messrs. Gray and Davison.

An interesting paper on "Warrington Friary, and the Recent Discoveries There," was read by Mr. William Owen, architect, of Warrington, before the Historic Society of Liverpool, on the 14th inst. Mr. Owen, who stated that the corporation of Warrington commenced to widen Bridge-street in 1886, and while excavations were being made for new buildings on the west side of the street some discoveries were made there by some workmen leading to further search, when there came to light the whole of the choir, the crossing, and some pillars of the nave of what had been the church of the Austin Friars, founded in the 13th century. The lecture was illustrated by a series of drawings, showing in detail all this work discovered, also a plan conjecturing the whole arrangement of the church. The tiling discovered was of special interest, owing to the richness of the pattern running down the centre of the choir, and also to the large area which had remained, about 36ft. long, with an average width of 5ft. The tiles and photographs by which the lecture was also illustrated were lent by the committee of the Warrington Museum, where the remains are now preserved.

Building Intelligence.

Cambridge.—Cavendish College was opened on Saturday by the Marquis of Hartington. The buildings, which are of red brick dressed with stone, and were designed by Messrs. Giles, Gough, and Trollope, and executed at a cost of £6,500 by Messrs. Claridge and Bloxam, of Banbury, consist of entrance-hall and porter's lodge, communicating with the several blocks by a colonnade, with open pointed arches and a court to the left, bounded on the other side by the hall. At the end of this and at right angles to it runs a passage with arched grills, into which opens on the left the hall, on the right the kitchens. The hall, 81ft. long by 43ft. wide, is faced with red brick, both within and without. The floor is of wood blocks with a daïs at the south end, and the walls, to the height of 6ft., are panelled with American walnut. The roof is pitch pine, with a *flèche* for the purpose of ventilation, the weather-cock at the top of the *flèche* being 95ft. from the ground. It is lighted by two large windows and one rose window at the south end, by smaller windows on either side, and by one rose window to the north. At the north end and of the whole width of the hall is a gallery 9ft. wide. Opening out of the hall to the right from the daïs is the combination room, which again opens into a court corresponding on the other side to the court on the left of the entrance colonnade. On the opposite side of the arched passage are the kitchen, buttery, larders, scullery, and store rooms and servants' hall. Over the high table hangs a portrait of the Duke of Devonshire. The chapel has not yet been built. Cavendish differs from the other colleges in its more perfect application of the principles of the common life, as the students breakfast and lunch together, not in their own rooms. Each man has a small sitting-room and bedroom on opposite sides of a small corridor.

Shipley.—New board schools which have been erected for the southern or Frizinghall portion of Shipley were opened on Saturday. A mixed school and an infants' school—two distinct buildings—and a curator's residence have been erected. The mixed school will accommodate 360 children, and consists of an assembly hall, 49ft. by 38ft., to accommodate all the children in the department, and five classrooms, each 26ft. by 23ft., to hold sixty children each. There is on each side an entrance lobby, with cloak-room, teachers' room, lavatory, and outside awning. In the infants' school, to accommodate 220, the assembly hall is 47ft. by 24ft., and there are two classrooms (for 50 each) 22ft. by 19½ft., with cloak-room, teachers' room, lavatory, and entrance lobby. The total outlay, including site and furnishing, has been about £7,900. Mr. W. Bailey (Messrs. W. and J. Bailey), of Bradford and Keighley, was the architect, and Mr. Walker, of Bradford, was clerk of works.

York.—The city school-board are about to erect their first batch of schools on a site facing Shipton-street. It will be in three departments, and will accommodate 650 children. The boys' and girls' schools will each consist of a central hall 50ft. by 14ft., with schoolroom 40ft. by 22ft., on the south side, and two classrooms 25ft. by 25ft. on the north; an extra classroom of the same size is also arranged on the north side for 60 girls. Coat and cloak-rooms are arranged near the entrances, which will be warmed with coils of pipes, and there will be private rooms for the teachers over the cloak-rooms, with windows overlooking the playgrounds. The infants' block will consist of a schoolroom for 102 children, two classrooms with places for 50 children in each, and cloak and teachers' rooms. The caretaker's cottage will consist of living room, scullery and pantry, and three bedrooms. The schools are all to be furnished with dual desks, and will be warmed with warm-air stoves, with airducts to each from the outside, and the assembly halls and cloak-rooms will be fitted with hot-water pipes. The walls are to be of local bricks, with Huddersfield red pressed and moulded dressings, and the roofs covered with green slates. The style of the buildings is based on that of the picturesque brick architecture which prevailed in the eastern counties in the 17th and 18th centuries. Messrs. Demaine and Brierley, of York, whose design was selected in competition, are the architects, and Messrs. Grantham and Whelan, of Monk Bridge Works, York, have taken the contract at £4,590.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Birmingham Architectural Association.—A meeting of the Birmingham Architectural Association was held on Monday at the Midland Institute, when Mr. G. A. T. Middleton, Sec. S.A., delivered a lecture entitled "The History of England Written in Stone." The lecturer commenced by stating that the builders of the world might be divided into two parts—the builders in stone and the builders in timber. The former descended from the cave dwellers, and the latter from the hut dwellers, according as stone or timber formed the available material. England was a timber-producing country, but the influence of the stone-building nations of the East was strongly discernible in this country. The lecturer showed the influence of the Normans upon the buildings of the country, and traced the subsequent development and progress of the styles. The lecturer illustrated his remarks with photographs of Stonehenge, Porchester Castle, Sompting Church, Tower of London, St. Botolph's Priory at Colchester, Durham, Chichester, Ely, Salisbury, and Lincoln Cathedrals; Tewkesbury Abbey, Henry VII. Chapel, Haddon Hall, Hampton Court, and other historic buildings.

Edinburgh Art Students' Association.—The inaugural address of the Art Students' Association was delivered by Mr. William Hole, R.S.A., honorary president, on Saturday evening, in the Architectural Association's Hall, George-street, Edinburgh. The special subject of the address was "How best to use your Time under the present Conditions of Artistic Apprenticeship." The time-honoured portal to the House Beautiful was, he said, the antique; and truly there was no better way. As the students spent their time in that study, so would they emerge from this preliminary stage with brain and hand prepared for higher study, or with no more knowledge of art than that with which they entered it. Its educational value lay in this—that in its absolute perfection of form it provided an unqualified basis for self-training, and a model upon which to found the principles of their future independent work. He contrasted the characteristics of the Classic spirit with those of the Gothic, and showed how the power of the former lay in its selecting and grasping the essential qualifications which constituted beauty, to the exclusion of that petty and childish elaboration of detail which was the delight of uneducated minds, and the undue emphasis of which, being a ready veil for inherent weakness of construction, had ever marked periods of artistic decadence. The Classic spirit, he maintained, ought to be their guide in this Victorian age, and being a principle, and not an accident, depending for its success on any particular period or surroundings, should influence alike subjective motive and objective expression in whatever branch of art they might elect to follow. This principle should be their leading motive in the humblest efforts or the loftiest conceptions to which they might ultimately aspire. Mr. Hole proceeded to deal with some of the difficulties involved in a study of the living models, and reminded the students of certain well-established and well-tested principles, by showing obedience to which they would make themselves masters of all rules.

Manchester Architectural Association.—The second ordinary meeting was held on the 19th inst., at the Diocesan Buildings, Mr. J. H. Woodhouse (President) in the chair. Mr. F. M. Simpson, of London, read a paper on "Old House Work," in which he said the difficulty in treating a subject like this was to decide upon what head to attack; but for the present he would confine his remarks to England. The rude accommodation of the 12th century was described, and its gradual development traced up to the present time. The most marked improvement in house-planning began in Elizabeth's reign, but the hall continued to be the principal feature until the Gothic Revival. About the 17th century we find traces of the foreigner having worked side by side with the English workman. A vote of thanks was proposed by Mr. Davies Colley, seconded by Mr. J. S. Hodgson, and supported by Mr. G. W. Mee and the President.

South Wales Art Society.—On Saturday evening a lecture was delivered at a combined meeting of the South Wales Art Society and the West Grove Social Union, at Tredegarville, Cardiff, by Mr. Edwin Seward, R.C.A., on "English Architectural Antiquities and Local

Archæology." The lecturer spoke of architecture as one of the highest forms of art in all ages for the expression of the loftier and more enduring sentiments of men's minds. Touching on the more notable remains of Roman civilisation, and on the effect of the architecture of Western Europe following the break up of that civilisation, he referred to the Saxon and Norman churches of England, outlining the chief steps by which during about 500 years church architecture expanded from the low vault-like structure with narrow windows to the vast and spaciously-lit interiors of the 14th and 15th centuries. The lecturer's comments were illustrated by about ninety limelight views, the first portion of which displayed the best known of the English cathedrals and abbeys. The latter portion chiefly consisted of some original views of old country houses and villages of half timber, or black and white work, which, though hardly ever met with near Cardiff, were in constant use all along the Welsh border, and well into Herefordshire, Radnor, and Shropshire. Many features of local architecture were also shown and described.

The National Association of Sanitary Inspectors.—On Saturday afternoon a meeting of the Central Council of the National Association of Sanitary Inspectors was held in the town hall, Halifax. The chairman, Mr. John Newhouse, of Leeds, presided. The correspondence of the Sanitary Institute and the Central Council with reference to examinations for sanitary inspectors was discussed, the general feeling being that the certificate now granted by the Sanitary Institute to candidates on passing the examination for sanitary inspectors was much below the standard desired, and was misleading to sanitary authorities. It was unanimously resolved that a deputation—consisting of the following members, Messrs. J. Newhouse (Leeds), W. Bland (Barton-upon-Irwell), J. Chambers (Bradford), T. Prescott (Gorton), A. Baines (Manchester), W. Wilkinson (Derby), J. Maguire (Huddersfield), and J. Lindley (Leeds)—should wait upon the council of the Sanitary Institute, and urge upon the board the desirability of adopting the following resolutions, which were unanimously passed:—

That examinations for sanitary inspectors shall be arranged in two grades.

Candidates presenting themselves for examination in the first grade shall prove themselves to possess a competent knowledge of sanitary science, as also a fair knowledge of the duties required to enable the candidate to fill the position of assistant sanitary inspector.

Candidates presenting themselves for examination in the second grade must have held the office (chief or assistant) of sanitary inspector under a public sanitary authority for not less than two years, and shall be examined in advanced sanitary science; also shall give proof of a knowledge of building construction and sanitary plumbing.

That examination questions shall not be published or allowed to be taken away by candidates at any time.

That not less than two members of this association shall be members of the Examining Board.

That the advanced certificate only be recognised for holding the position of a chief sanitary inspector.

CHIPS.

The new Royal Observatory for Scotland is to be erected on Blackford-hill, Edinburgh, and will have a dome 32ft. in diameter over the main observatory. The buildings are, it is thought, likely to cost considerably more than the £15,000 originally suggested as the outside limit.

Mr. T. W. Debney, surveyor to the Darlaston local board, has been appointed surveyor of main roads for the Eastern Division of the county of Lancashire.

Thorverton Mills, Devonshire, which have been fitted up with every improvement in the matter of turbines and rollers, have, within the past week, been lit by electricity. This work has been carried out by the firm of Messrs. Christey, Son, and Norris, of Chelmsford. The power is supplied by a low-speed dynamo with registered speed of 800 revolutions per minute, and the machine is capable of supplying 60 lights of 16 candle-power each.

Mr. T. D. Bolton, M.P., has opened up an estate in Windsor by making a road, 42ft. wide, and laying sewers and other works, &c., costing several thousand pounds. Messrs. Currall and Lewis, of Birmingham, are the contractors for the works, which have been carried out under the supervision of Mr. T. V. N. Davison, A.Memb.Inst.C.E., Windsor, engineer of the works.

The first meeting for the season of the Architectural Section of the Glasgow Philosophical Society was held on Monday night, in the rooms, Bath-street, when the president, Mr. Jas. Thomson, F.R.I.B.A., delivered the opening address on "Progress in Architecture."

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

T. S. J. (It is impossible to say, from particulars given, what causes the chimney to smoke. Try one of Boyle's cowls. We have found them successful where nothing else answered.)—Articles. (No necessity to sign; possession is sufficient.)—A Constant Reader. (Write Mr. G. A. Middleton, the secretary at the office of the Society of Architects, St. James' Hall, Piccadilly. He will send you a nomination paper and all particulars as to subscription, &c.)

Received.—M. Bros. and Co.—B. of Y.—F. C.—E. H. S.—S.E.—W. V. R.—G. W. Ry. Co.

"BUILDING NEWS" DESIGNING CLUB.

Drawings Received.—"A. G." in circle, "Vyrnwy," "Herbert," "Country Bumpkin," "Sabrina," "Cosmopolitan," "Point," "Skull and Crossbones," "Myth," "Menelaus," "Faust," "Donovan," "The Red Rover," "Argus," "Damian," "St. Tydno," "Yeoman," "M." in a square, "Coaly Tyne."

An Old Member. (No one can win the same prize again, but a lower prize man may take a higher one.)

Correspondence.

ASTON HALL AND JOHN THORPE.

To the Editor of the Building News.

Sir,—The publication of the view and plan of Aston Hall, in the Building News for Sept. 27th (p. 417), with the interesting description annexed to it, made me desirous of comparing the plan there given (from Mr. Niven's work) with the plan to be found in the volumes of drawings attributed to John Thorpe in Sir John Soanes's Museum.

It was only this week I was enabled to do so, and it appears to me that the two plans seen therein (ground and upper floors) are doubtless some first *sketches* for Aston Hall. One of them has "Sir Thos. Holt" written on it. But the rooms having been enlarged and altered subsequently, and others added, to obtain additional accommodation, we are left in doubt as to who was the architect—Thorpe or Jones—of the edifice as *erected*.

We do not know the date of the death of John Thorpe. The mansion was commenced in 1618, and Holte came into residence in 1631 (as inscription). The last edifice which I attribute to Thorpe (in my work, "The Renaissance," &c., in Great Britain) is 1612 *circ.*, Little Charlton, Kent, built for Robert Filmer. Now, did Thorpe die before 1618, and were these prepared plans for Aston Hall consequently passed over to Inigo Jones, who made others, enlarging the building for its builder, or building-owner, as Holte might be termed nowadays?

The following reference attracted the attention of Peter Cunningham in 1867, and until writing the article "Thorpe" for the "Dictionary of Architecture" it had escaped my recollection, and I have not seen it hitherto quoted. In the 1634 edition, page 162, of "The Gentleman's Exercise," &c., by Henrie Peacham (there was a first edition published in 1612, which I have not seen), occurs the following, and to us very interesting paragraph:—

"Coat of arms azure a star or between three crescents argent, belonged to the abbot of Tame whose name was Thorpe, and now borne of master John Thorpe of the parish of Saint Martins in the field, my especiall friend, and excellent geometrician and surveiour, whom the rather I remember, because he is not only learned and ingenuous himselfe, but a furtherer and favorer of all excellency whatsoever, of whom of our age findeth too few;—and lastly, the aforenamed master John Thorpe his sonne, to whom I can in words never bee sufficiently thankful."

Does not this show a father and son? Other evidences prove a John Thorpe was living in 1590, 1606, 1609, and 1611; also 1612. Did he, then, die between 1612 and, say, 1615 or 1616, the probable date of the *preparation* of the plans for Aston Hall? This same coat of arms is appended to the name of "Thorpe of London and Northampton," in Burke's "General Armory," p. 1012, of 1878 edition.

Having thus obtained for the first time a clue to the residence of a Thorpe, through Peacham's work, I attended the vestry and inspected the register of burials of St. Martin's parish, beginning at the year 1600 and ending at 1624. Up to 1618 I found two Richards and a Rebecca Thorpe (as far as my recollection goes, for I did not make a note of them), and on 23 September, 1618—the year is a curious coincidence perhaps,—I found the entry of "Johne Thropes." Is it our friend? All searchers know the little regard paid to the spelling of names in those days, and there is reason to believe that the present registers are old copies of older lists.

Another edition of Peacham's work was published in 1662, and on p. 162 appears the same statement as I have copied above. I think I may fairly conclude it appeared in the first edition of 1612.—I am, &c.,

Wyatt Papworth.

LORD GRIMTHORPE OUTSIDE ST. ALBAN'S.

Sir,—Lord Grimthorpe, in the current number of *Murray's Magazine*, treats the British public to an article entitled "Church Restoration Principles." It is entertaining enough reading, to an outsider but moderately interested in St. Alban's Abbey, to note the lively sort of Lord Grimthorpe's controversial style, and to laugh at the palpable hits which he undoubtedly makes and scores against some of his critics and opponents. But my Lord Grimthorpe, to a vast majority of outsiders—about 99 per cent. of the practising architects of this kingdom—appears to make a great deal too much of his St. Alban's affairs and a little knot of men whom he has happened to engage in a controversy, and who are not, in the estimation of architects in general, men of pre-eminent sense and importance, and some of none at all.

There was a "proper contract with the builder (the one given in my 'Book of Building,' which architects abhor)," says Lord Grimthorpe in this article. I take on myself for outsiders—that 99 per cent. I have referred to—to say that they do not "abhor" Lord Grimthorpe's "Book on Building," that they never read it, or, judging from what they have seen of Lord Grimthorpe's utterances in casual literature, would not be bothered to read his "Book on Building"; do not "care two rows of pins" (to quote Sir Robert Peel) what Lord Grimthorpe thinks or writes about architects, and think they can compass the making of very "proper contracts" for the expenditure of millions of money per annum throughout the kingdom, without being taught their business by somebody's "Book of Building." The general reader, who goes with some interest to a magazine article grandiosely headed "Church Restoration Principles," will look for something beyond the personality of Lord Grim-

thorpe and the petty squabbles of St. Alban's. He will judge that in such an article as this, under such a heading, Lord Grimthorpe rather takes "the petty cackle of his bourg to be the murmur of the world," and cry with the irate knight of Tennyson—

"A thousand pips eat up your sparrow-hawk."

But, says Lord Grimthorpe, when he is in a vague way on the "principles," and arguing how excellent a thing it was to hand over St. Alban's Church to *me*—

"The two Dublin cathedrals were handed over to individuals quite as absolutely as this" (St. Alban's). That, I say, from Dublin, is not true. To be sure, Lord G. goes on to say: "*I am not concerned with the results, and have not seen them*, though I once went to look at a picture-book about one, and didn't look at it," &c. In the name of goodness, if he is not concerned about the results, and knows nothing about them, for what does he lug in them and the inconsequent picture-book by way of an argument? The fact is that "the results" had much better have been left alone by my Lord Grimthorpe in this connection. The cases of the Dublin Cathedrals "point a moral and adorn a tale" by contrast the exact reverse of what Lord G. would have people take as argument.

One Dublin Cathedral does furnish a parallel case for St. Alban's, and was handed over to an amateur authority as absolutely as St. Alban's to Lord Grimthorpe. I do not care now to reopen the question of "results." Lord G.'s friend and defender "Ars," of the BUILDING NEWS, could give him a square opinion about that. No Dublin man, overwhelmed in feeling as he must be by the successive goodnesses and generosity to Dublin of a great family, and under obligation to them for one princely gift after another throughout the last 25 years, would wish to go back on the mistakes of a generous and well-intentioned rebuilding of one of the Dublin cathedrals, handed over absolutely to an individual restorer—a member of that kindly family—so long ago.

We have learnt a more accurate conception in Dublin of what a cathedral restoration should be in a quarter of a century. Some people about St. Alban's diocese appear to be "no forrader."

The case of the second cathedral of the book of pictures, is, as far as it can be, no case for Lord Grimthorpe; but, by comparison with the other case, a dead case against his glib argument. This was handed over to a munificent restorer likewise, but on the distinct agreement that it was committed to the best-known and trusted English church architect which the restorer, at all events, thought he could find for the dean and chapter's acceptance, and the influence of the dean and chapter, exercised especially through their representative man, the Rev. Precentor Seymour, was never relaxed for one hour during the seven years of the restoration, or attempted to be ignored by any individual.

We take leave—as what architect or ecclesiologist will not?—to make our criticisms now and again on some details of restoration by a distinguished architect; but we are not quite so prejudiced as not to be thankful for the marvellous recovery from mere fragments of a lost, forgotten, and remarkable church. Where would it have been, we may well say, if this job had been given over to the self-contained amateur, and his intelligent clerk of works (who wouldn't attempt to design anything), and the wise builder, as Lord G. would have done it, instead of to an ingenious and accomplished architect?

If Lord G. has not concerned himself more about the remarkable restoration of a small church in Dublin, which is unique in the history of church restoration, further than to go to look for a book of pictures of it at the R.I.B.A. Library, which he did not find there, it does not strike one that his zeal and study of British church restoration can be wide—beyond St. Alban's—or exhaustive. If he has no concern about the result of the restorations, it would be better not to quote the cases so dead against him. His candid defender, "Ars," would tell his lordship as much as that.—I am, &c.,

A DUBLIN ARCHITECT.

THE NEW MOSQUE AT WOKING.

SIR,—In your last issue a paragraph appears relating to above building which is somewhat misleading, and as architect and designer of the edifice kindly allow me to correct. You state there are four minarets. As a matter of fact, there are no minarets to the building at present. It is true there are four ornamental terminals to the piers in front elevation of building: but these are not minarets, nor did I ever contemplate these being used as such. A glance at the illustration in your issue of 2nd August will convince you that neither in form or size are they suitable as such, and on reference to the text in same issue you will see the following:—"It is greatly to be regretted that funds would not permit the erection of a minaret." And further on it gives a description of a minaret, and concludes by saying: "It is to be hoped that eventually the mosque at Woking will be provided with one at least of these necessary adjuncts." You also call attention to the courtyard, mosaic pavement, and shawl tapestry as being the most successful features of the mosque. I presume this is a joke! or that, with your usual kindness, you have inserted a paragraph sent you, and have not personally seen the place. These have been added since I ceased to be architect for the building. Therefore, I disclaim any merit as being their author. I, however, inspected them a short time since. As for the mosaic, it is a miscellaneous job lot, obtained from the prison at Woking, of various sizes and patterns, and laid by a handy (!) man; and where defective or insufficient, the interstices are filled up with some dark material (pitch, I think). The shawl tapestry alluded to is even more unsuccessful. Originally it was intended to cover the interior of the dome with Lincrusta, to be afterwards decorated in gold and colours. I find, to my horror, some dingy-looking Indian shawls tacked on instead. Even this might have been passable if artistically arranged; but the top of dome has some perforated stars filled with yellow glass to light upper part of dome. They are apparently not considered in the arrangement of the shawls, and come at random on the top of them. I leave you to imagine the result. Again, you state the courtyard is one of its most successful features. Imagine a large, semicircular area inclosed with a brick wall about 3ft. high, and a bank of earth thrown up against it, on the top of which is planted a scraggy privet hedge and a few evergreens, the whole place turfed excepting a small square tank in centre, edged with the miscellaneous assortment of mosaic (above alluded to), and a path leading to entrance. This constitutes the courtyard. Kindly refer to your illustration to see if the building is worthy such a noble inclosure.

I am by no means thin-skinned, and the paragraph, on the face of it, is so one-sided that it really needed no contradiction. You deliberately praise whatever has been done since I ceased my connection with the building—even the above-mentioned—and as you cannot find fault with the design, you attack the costumes and postures of the figures introduced. I merely want it understood that I am the designer and architect for the building, and to disclaim any connection with the furniture or accessories. Let the honour of such productions be given to the rightful persons.—I am, &c., W. I. CHAMBERS, Architect.

Albany Court-yard, Piccadilly, W.

[We wish the Mosque at Woking had been built at Jericho or some place distant enough never to have troubled us! We illustrated the building at the request of the architect, and we have since been assured by other parties that our illustration and description were inaccurate, and that we must insert the paragraph which appeared last week in order to do justice. We do this, and now it appears we have injured the architect. Really, if there is some dispute between the owner of the building and his architect—of the merits of which we are, of course, ignorant, and to which we are indifferent—they must fight their quarrels out elsewhere, and not in our columns.—ED. "B. N."]

THE OLD HALL, GAINSBOROUGH.

SIR,—In answer to the letter of your correspondent under this heading in last week's BUILDING NEWS, the following information, which I have since received from Sir Hickman B. Bacon, I now submit to you.

The Saunderson family were connected with the Wrays, of Fillingham, near Gainsborough, and they acquired, through a marriage, part of the property of the Wrays in Glentworth and Blyton, also near Gainsborough. They also had some property from the Watson Wentworth family, probably comprising Sandbeck Park, near Rotherham, through marriage with one of the co-heiresses of the last Marquis of Rockingham, the eldest son of whom took Wentworth Woodhouse into Lord FitzWilliam's family. The Saunderson family—at least, the branch referred to—is now extinct, the estates having passed into the family of the present Earl of Scarborough. Viscount Castleton (whose surname was Saunderson) was a friend and relative of the predecessor of Sir Hickman B. Bacon, the present owner of the Old Hall. Sir Hickman now has in his possession a number of old portraits of the Saunderson, Wray, and Wentworth families, which probably may have belonged to some member of the first-named family. Doubtless the fireback, with the inscription "T. S., 1619," upon it, came from the same source. Thanking your correspondent for the light he has thrown upon the ownership of the coat-of-arms portrayed on the fireback,—I am, &c.,

HENRY GILBERT GAMBLE.

FRENCH JOINERY.

SIR,—The writer of your leading article last week, in pointing out the artistic superiority of the ordinary French door, with its narrow rails and stiles, seemed to totally ignore its inherent constructive weakness. A door with all its rails and stiles only 3in. wide may be light both physically and artistically, but it is bad construction for movable joinery, and for this reason—that there is not sufficient length to the tenons and shoulders to keep the door square, *i.e.*, from getting the rickets, and then dropping and dragging on the floor. In the report we are also told that the tenons are only pinned in, so that here again the construction is weak; the slightest shrinkage of the stile away from the shoulder of the tenon gives a tendency to the rails to drop.

Now, we are constantly told that true art is ornamented construction, that is, construction first and art afterwards. A door is after all a piece of construction—and, as such, should be designed with a view to its strength as well as appearance. The constructional advantage of wide rails and moderately wide stiles is, that the greater length, both of tenons and shoulders have a better tendency to keep the door square; they are in fact to a door what depth and fixed ends are to a beam—a great increase of leverage in the moment of resistance as opposed to the moment of strain.

As regards the mouldings, however, the so-called French method is, without doubt, the best in the case of bolection mouldings; but the writer has some recollection of having seen the method adopted years ago in a provincial workshop in the case of a heavy bolection moulded mahogany door. If the mouldings are flush or below the surface, then neither the French or English method of working them separately can be considered the proper way, for they ought to be worked on the solid framing.

The superiority of the French design no one can question, for nothing can be more ugly and monotonous than our ordinary four panel door with its planted moulding. But this much-abused door could easily be rendered more pleasing in appearance by returning to the older English style of working. Let anyone refer back to the design by your gifted contributor, Mr. Maurice B. Adams, and note the pleasing appearance and constructive fitness of his doors; there is always at least one wide rail, and the stiles appear of ordinary width, yet the designs will bear comparison with anything produced by the French.

One way of improving our ordinary door without increasing the cost would be as follows:—Let the bottom rail, top rail, and stiles remain as at present, reduce the muntings to 3in. wide, take out the wide middle rail entirely, and in its place put a rail, same width as top rail, at about half or two-thirds the height of the door; by this way, which is somewhat after the style of the old doors, we could relieve the monotony of the ordinary method, and, if anything, reduce the cost. If the objection is raised that a 6in. or 7in. mortise lock cannot then be used, the reply is, Why use locks of such length when a 3½in. one would answer the purpose? We use pulpit latches of this length for w.c. doors on the best floors, and there cannot, therefore, be any objection to a mortise lock the same length. Again, why use mortise locks at all when ornamental plated rim locks are made suitable for every class of work?

In conclusion, the question of the design of our joinery is seldom indeed left to the workman

—not that, as things are at present, it would be much improved if it was; but it is rather hard to blame him for all its ugliness when we know that it rests almost entirely with the architects.—I am, &c.,

A Teacher of Building Construction.

WORKINGTON SCHOOL BOARD.

Sir,—I inclose you particulars I received in reply to my application for same. How any Board can sit, and sanction such instructions to be sent to architects up and down the country I fail to see.

I shall be pleased if you would kindly give the matter prominence in your paper.—I am, &c.,

H. J. Price.

16, Pepper-street, Bridlesmith Gate,
Nottingham, Nov. 18.

WORKINGTON SCHOOL BOARD.

INSTRUCTIONS TO ARCHITECTS.

1. It is proposed to erect a girls' school over the present girls' and infants school, and over part of the playground at St. John's Board School. The style of architecture and materials used to be similar to the present structure.
2. The plans which are considered most suitable and combine efficiency with economy will be recommended by the board to the Education Department for approval, and the architect whose plans are finally accepted shall carry out the work.
3. The accepted plans, specifications, &c., to be the property of the board.
4. The board do not bind themselves to accept any plan.
5. No payment will be made for any plans submitted.
6. The architects to state the terms upon which they are prepared to carry out the work, which must include the cost of all plans, specifications, &c., and superintendence in carrying out the work.
7. All plans, specifications, &c., which must be in accordance with the building rules of the Education Department, to be accompanied by an estimate of the cost, including architect's commission, &c.
8. The plans to be drawn to a scale of eight feet to one inch.
9. The material in the present buildings to be used as far as found suitable.
10. The plans, &c., sealed and endorsed "school plans," are to be delivered to the clerk of the board on or before the 28th day of November at noon, after which time no plans will be received.

By order,
John Dand, Clerk to the Board.

Workington, Oct. 31st, 1889.

WAKEFIELD BOROUGH SURVEYORSHIP.

Sir,—I have had my attention called to a paragraph in the Building News of to-day's date, in which it is stated that I have been elected to the above position. Will you allow me to correct the error in which your informant has led you, by stating that the position for which I have been selected is that of engineer, surveyor, and waterworks manager to the Wakefield Union Rural Sanitary Authority.—I am, &c.,

Frank Massie, Assoc.M.Inst.C.E.

St. Paul's Chambers, Sheffield, Nov. 16.

CHIPS.

The equestrian statue of William III. on the Clifton-street Orange Hall, Belfast, was formally unveiled by the Rev. Dr. Kane on Friday. It is the work of Mr. Harry Hems, of Exeter, is executed in bronze, and weighs 37cwt.

Some progress is being made with the construction of the Overhead Railway at Liverpool. Mr. J. W. Willan is the sole contractor for the undertaking.

The Prince of Wales has just had a memorial tablet bearing a medallion portrait of the late Emperor Frederick, executed by Sir E. J. Boehm, R.A., for Sandringham Church, Norfolk.

Mr. Harry Robert Newton, architect and surveyor, of Thames-syde, Weybridge-on-Thames, died suddenly on Thursday, the 14th inst. He was formerly in practice in Argyll-street, Regent-street, W. He was one of the senior members of the R.I.B.A., having joined as an Associate in 1853, and became a Fellow in 1860. Mr. Newton was the last surviving son of the late Sir William John Newton, and nearest collateral descendant of Sir Isaac Newton.

A chancel screen of hammered iron, gilded all over, is about to be placed in the Town Church of St. Peter le Port, Guernsey, as a memorial of the late F. C. Lukis. It has been designed by Mr. Trollope, the architect for the recent restoration, and is being executed by Messrs. J. Starkie Gardner and Co.

Sir Edgar Boehm has been commissioned to execute a bronze statue of the Marquis of Dufferin and Ava, to be erected at Calcutta. The memorial is 10ft. high, and represents the marquis in a standing position and wearing his robes and orders.

A memorial to the late Henry Richard, M.P., has been placed over his grave at Abney Park Cemetery. It is the work of Mr. E. J. Physick, is Gothic in character, and is executed in Sicilian marble. The chief feature is a medallion portrait in high relief.

Intercommunication.

QUESTIONS.

[10152.]—**Sugar in Mortar.**—I have a local stone building to erect this winter, and am much afraid of damage by frost. Will sugar mixed with good lime mortar set quickly, and be proof against freezing? What is best kind of sugar for the purpose, and how is it gauged? Hints from a practical builder who has had experience in this will be esteemed. Economy must be studied.—Jack Frost.

[10153.]—**Dilapidation.**—Under the usual clause in a lease "to repair, unhold, maintain, slate, pave, scour, cleanse," &c., can whitewashing or colouring be claimed? and does the word "cleanse" give that, or under what other clause could it come? Does reasonable wear and use infer anything or not? Information will oblige.—Learner.

[10154.]—**Water-Pipes.**—We all know that lead pipes are considered rather objectionable for conveying drinking water, and the mains are of iron. Is there any objection to copper pipes? And, if lead pipes are tinned inside, does the tinning last long? Is there are any reason why iron should not be used throughout up to the draw-off?—Notting Hill.

[10155.]—**Charges for Fire Loss Assessment.**—Would some experienced fire loss assessor kindly tell me what is the usual scale of charges for assessing damages caused by fire under the following circumstances?—A client wishes to have his losses estimated, and hoping to avoid the expense of detailed quantities, gives instructions for an estimate to be made based on cube measurements, for which he stipulates he shall pay £1 per cent. The Insurance Company refuse to recognise a claim based on an estimate obtained in this way. He next obtains and brings rough tracings of his plans of the premises without specifications, and gives instructions to take out detailed quantities and make estimate of losses sustained. The total loss is estimated at more than the amount he is insured in—there is considerable salvage. Can the Insurance Company deduct value of salvage? Can I obtain the £1 per cent. on first cube estimate as stipulated? and what am I fairly entitled to charge for taking out detailed quantities, without the assistance of specifications, and making out estimate for losses from detailed quantities? The losses sustained were estimated at a little over £1,600.—Enquirer.

REPLIES.

[10116.]—**Copper Roofs.**—In the Building News of Nov. 8, "A. H." says that Messrs. Braby and Co. covered St. Peter's Church, Cornhill, with copper. This is a mistake, as Messrs. Ewart and Sons, of 346, Euston-road, did the whole of the work, under the superintendence of Mr. Flint, architect.—R. H.

[10139.]—**Ventilator to W.C.**—Down-draught is not necessarily the result of the superior density of the air outside. It may be a suck-down, not a blow-down, as in a house with a lot of fires on in it, and insufficient air-inlets, and all the windows shut. The way in which the wind strikes the ventilator, especially if it does not get freely past it, may cause a pressure of the wind, the result of which may be down-draughts. Some ventilators or cowls allow down-draughts more readily than others. The suggestion to make provision for the inlet of fresh air near or at the floor is good.—W. P. Buchan.

[10140.]—**Spire.**—To set out the entasis of spires (*Builder*, Aug. 5, 1848). "Dear Sir,—The inclosed is an ingenious scheme for regulating the entasis of the spire, communicated to me by my friend, Mr. Turner, of Hampstead, an accomplished mathematician; at my request he permits me to offer it to you.—I am, &c.—C. R. Cockerell.—The principle upon which the plumb-rule I mentioned to you was constructed is as follows:—The side A F C of a vertical section of the spire is an exact circular arc. A E C is the chord. Let M S T N represent a plumb-rule so framed that the line O P, perpendicular to the base S T, represents the position of the plumb-line when the rule is set against the chord, or the centre F of the arc. Let then O Q represent the position of the line when the rule is placed against the base A of the spire, where the slope is least, O R its position at the summit C, where the slope is greatest. It is obvious that if we determine by calculation the length Q R of the scale through which the plumb-line moves as the rule is pushed up the face of the spire, and can divide the scale into divisions, which will give the proper position of the plumb-line at any assigned height, we shall have a rule which will serve to set every stone in the spire with perfect accuracy. Now, it will be seen at once that as the plumb-rule is pushed up the face of the spire, the angle which the plumb-line (itself stationary) describes on the surface of the rule is, in fact, the angle through which the edge N T (which is always a tangent to the spire) actually moves. In other words, the angle V G C, made by the tangents at the extremities A and C of the curved face of the spire, is equal to the angle Q O R. So the angle G A E, which is half V G C, and which is the angle which a tangent at A and another at F would make with each other, is equal to the angle Q O P, The similar triangles Q O P and G A E give us, therefore, the following proportion:—

$$Q P : P O :: G E : E A$$

Whence—

$$Q P = \frac{P O \times G E}{E A}$$

But the arc A F C being a very small part of a circle, G E = 2 F E very nearly, or twice the entasis, and A E = ½ A C, or half the length of the spire. Therefore—

$$\frac{G E}{E A} = \frac{2 \times \text{entasis}}{\frac{1}{2}\text{ length of side}}$$

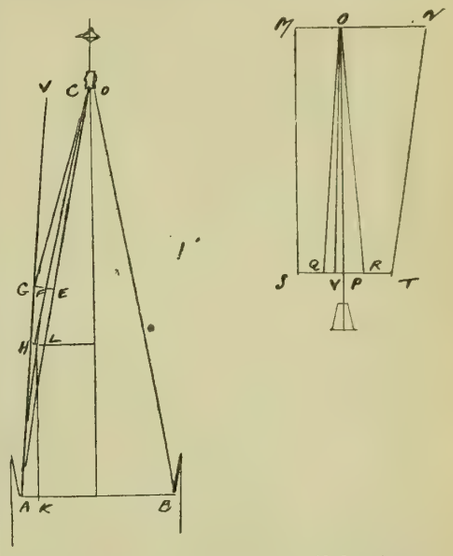
But in a tolerably acute spire, the height of the spire may be taken instead of the length of the side, and we have—

$$Q P = P O \times \frac{4 \text{ entasis}}{\text{height of spire}}$$

In the church at Herriby, the height of the spire is 74ft., the entasis 6in., and for convenience sake the length P O of the rule was taken at 37in., which gave—

$$Q P = \frac{37 \times 4 \times 6}{74 \times 12} = 1\text{in.}$$

The whole scale Q P was therefore 2in. The graduation, assuming the face A F C to be a circular arc, is very simple, for it results from that form that, as the plumb-rule is pushed up the spire, the angle which any two positions of the plumb-line on the surface of the rule make with each other will be exactly proportional to the height through which the rule has been moved. If, therefore, on the same scale on which Q R represents the whole height of the spire, Q V represents the height H K of any point H, O V will represent the position which the plumb-line ought to take when the rule is set against the point H of the spire. In the rule used at Herriby, there was a division marked in Q R for every 5ft., beginning, of course, with zero at Q, and ending with 74ft. at R. In the same rule the side N T was slightly hollowed so as to fit the curvature of the spire; but as the depression was only 1-30in. in the centre W, this was a nicety perhaps scarcely necessary to attend to. In the construction of the spire at Herriby, the quoins were all set by the rule I have mentioned, the accuracy of the work being tested from time to time both by trying the length of the diameter of the spire at the place where the working was going on, and also by dropping plumb-lines from each side upon a base where the centre was marked,



by which means any irregularity would be at once detected; but the rule was found of itself to make the work as correct as possible. The beds of the courses being horizontal, the angle or bevel at which the stones were cut was varied slightly every 10ft. or 12ft. so as to suit the varying rate of reduction in the length of the ordinates. In calculating the ordinates the following formula was used for determining the success due to the entasis. Let h be the whole height of the spire, x the height H k of any point H, e the entasis or F E, then we have—

$$H L = 4e \times \frac{x(h - x)}{h^2}$$

very nearly. But the architect, Mr. Pearson, found that he got the ordinates very nearly true by a mechanical process—*i.e.*, merely taking a thin lath and bending it to the extent requisite."—Thomas Turner."

Thomas Potter.

[10145.]—**Public Buildings.**—The price per foot cube of public buildings will depend on the locality, the materials used, the number of rooms, and ornamentation. From 1s. to 1s. 3d. may be taken as an approximate guide for estimates.—G. H. G.

[10148.]—**Beams, Floors, and Joists.**—Consult Hurst's, Tredgold, or any other work on the strength of beams. (1) If 11 tons can be carried on a beam supported by a centre column and at ends, it would carry only one quarter of that weight if the centre column were removed, for the moment of strain when there is a middle column is one-fourth that of the beam resting on the end supports only; the beam, in fact, can be loaded with four times the weight to produce the same strain. If the weight is distributed the effect of the strain on the beam is half what it would be if the load were in the centre. (2) The binders being divided into three parts by the girders which run the short way of the floor, will each have a distributed load of the floor, 6ft. 6in. by 10ft superficial to carry. The formula can then be worked out from the weight so found.—G. H. G.

The hoarding was removed on Monday from around the fountain erected before the Town Hall of Birmingham as a memorial to the late John Henry Chamberlain, architect, of that city, which has been in the stonemasons' hands for some months for the purpose of renovating the lower portion of the front of the structure. Owing to the use only of Portland stone, the combined effects of water and frost had caused very serious and unsightly dilapidation. The damaged portion has now been replaced by a plinth and basin of granite, and specially prepared stone for the ornamental work. It has been necessary, however, to lower the basin, and to alter the design by the construction of a gable with tracery, to fill the portion of the front which the basin formerly occupied. The work has been carried out from the designs of Messrs. Martin and Chamberlain, and the new portion harmonises satisfactorily with the rest of the structure.

LEGAL INTELLIGENCE.

In re E. Garrett.—An application was made to Mr. Registrar Hazlitt on the 14th inst. by Edmund Garrett, trading as a builder at West Hampstead and Eastbourne, for an order of discharge. The liabilities were returned at £1,859, with debts fully secured £5,000, and the assets have realised £20. The bankrupt commenced business in December, 1883, with £50 of his own and £50 borrowed money, and built a number of houses at West Hampstead, all the wages for which and some of the materials were advanced by the freeholder. Since December, 1887, the bankrupt has discontinued building and been employed as a builder's foreman. The Official Receiver reported that the bankrupt had brought on his bankruptcy by rash and hazardous speculation. His Honour suspended the discharge for two years from the date of the bankrupt passing his examination in August last.

The Rival Restorers at St. Alban's.—Gibbs v. Grimthorpe.—Mr. Chancellor Jeune resumed on Saturday in the Carey-street Arbitration Room of the Royal Courts of Justice the hearing of the petition presented by Mr. Henry Hucks Gibbs, of Aldenham House, Elstree, Herts, praying for a faculty authorising and enabling him to continue and complete the restoration, repair, and refitting of the great screen of the cathedral church of St. Alban's, and also confirming the restoration, repair, and refitting already carried out by him; and, secondly, authorising and enabling him to do the repairs to and to restore and refit the portion of the said cathedral called the Lady-chapel, with its ante-chapel, and any works incident thereto, and to do all such things as might be necessary or proper to be done in connection with the said works. This petition was with the assent of the rector, churchwardens, and certain persons forming a committee, to whom a faculty, dated March 27, 1877, had previously been granted. The committee's funds becoming exhausted, they consented to an offer made by Sir Edmund Beckett, now Lord Grimthorpe, that he would reconstruct the west front, open out windows in the wall of south aisle to nave, and do other works at his own expense. The petition was opposed by Lord Grimthorpe, on the grounds that under a faculty granted to him in 1880 he carried out extensive repairs and restorations in the cathedral, and he now claimed that his faculty included the screen and the Lady-chapel and the ante-chapel, for which faculties were now asked by the petitioner. It was not sought by Mr. Gibbs, or by argument on his behalf, to raise any question as to Lord Grimthorpe's faculty except in so far as it was necessary to show that the faculties asked for by Mr. Gibbs were not inconsistent with the powers already granted to Lord Grimthorpe, but could be properly sanctioned without any derogation of the rights of Lord Grimthorpe. Sir Walter Phillimore, Q.C., and Mr. C. A. Cripps, instructed by Messrs. Freshfield and Williams, appeared for the applicant; Lord Grimthorpe appeared in person. Among those present were Lady Grimthorpe, Mr. Gibbs, Mr. Carbery (clerk of works to Lord Grimthorpe at the cathedral), Mr. H. R. Gough, Mr. S. W. Kershaw, and other architects. Mr. Cripps continuing the argument on behalf of Mr. Gibbs, said the petitioner asked for two faculties, first for the completion of the great screen, and secondly for the restoration of the Lady-chapel. He contended that the grant to Lord Grimthorpe ought to be construed in its true meaning in a limited form, and if so limited it might be held to be good, but could not then comprise the works to the screen or Lady-chapel for which Mr. Gibbs was now asking for a faculty. In support of his argument that Lord Grimthorpe's faculty to "restore, repair, and refit" must be construed in a form limited to the works at the west end and in the south aisle, he quoted the following cases heard in the Ecclesiastical Courts: "Maidman v. Malpas" (1 Consis. Court, 207), in which certain fittings on the chancel were held by Lord Stormont to be irrelevant to the reredos; "Clifton v. Ridsdale (2 P.D., 350), the famous case of the chancel screen at St. Peter's, Folkestone, in which Lord Cairns decided that no ornamentation could be added under the faculty; "Hughes v. Edwards" (2 P.D., 370), the Clifton reredos case, in which a dado on either side of the reredos and not shown on the drawings was held by Lord Penzance not to be part of the reredos; and "Hansard v. Parishioners of St. Matthew, Bethnal Green" (4 P.D. 46), the case of a mortuary, decided by Dr. Tristram. All these he contended showed that a faculty should be limited in its construing strictly by reference to the petition and citation, and that the citation in the case of Lord Grimthorpe did not apply to the cathedral of St. Alban's, but only to specified and particular portions. Lord Grimthorpe, in answer, urged that there was no precedent for granting a faculty against an existing faculty which had been worked under, and that it was asking for a faculty to start a row between two sets of workmen, for he would not be stopped by any decision the Court might think it proper to give. His faculty gave unlimited powers in St. Alban's Cathedral, and was a good one. That being so, the Chancellor had no discretion; but even supposing it were otherwise, there was no reason for granting the faculty as prayed. He had been going on with the restoration at enormous expense under his faculty for a period of ten years, and there were two little bits now left. A stranger came in and said, "The man who has been doing all this ought not to be allowed to do the remainder, because he has been acting illegally." He further said, "I have also been acting illegally by his leave, and I ought to be allowed to take the remainder of the work out of his hands and get the glory of doing it." That was what was wanted, and it was argued that the petitioner should have the permission simply because he asked for it. There was no precedent for advancing a conflicting faculty against a real live faculty, which had been carried on to the present day. The whole of the trouble had arisen because he was too good-natured to Mr. Gibbs. He had out of kindness consented to adopt any work Gibbs might do to the screen on certain conditions, and this was the result. As to the screen, that came within the general powers for restoration which he possessed. Of course, he could not restore it as it was before, because there was formerly a crucifix, which could not now be replaced. Sir Walter Phillimore: Why not? Lord Grimthorpe: Because it is illegal. Sir W. Phillimore: Who says so? Lord Grimthorpe: If you do not know I will not waste time over the matter—sufficient for the purpose was it that he would not restore a crucifix. If the Court should be of opinion that his faculty was in jeopardy, and that a new one might be necessary, he submitted that it should be granted to the person who had done all the work, and not to a person who had done nothing. Sir W. Phillimore having replied, the Court adjourned, judgment being reserved.

WATER SUPPLY AND SANITARY MATTERS.

Sydney.—The New South Wales Parliament has recently authorised the construction of some extensive sewerage works in that colony, and the Government are about to proceed with the sewerage of the western suburbs of Sydney at an estimated cost of £1,817,896, the sewerage of St. Leonard's and other North Shore boroughs at a cost of £106,000, and of the borough of Manly at a cost of £34,000. The population of Sydney and suburbs now amounts to nearly 400,000; but the sewers are designed for a prospective population of some 750,000 persons. The engineer who has devised these works is Mr. George H. Stayton, M.Inst.C.E., formerly surveyor to the vestry of Chelsea. Mr. Stayton is on a short visit to England, the Government having commissioned him to inspect and report upon the latest systems of sewage purification and sanitation.

CHIPS.

The Harbour Board of Southampton have appointed Mr. John H. Blizard, A.M.Inst.C.E., and Mr. H. J. Weston, A.M.Inst.C.E., joint quantity surveyors for the Royal Pier extension works to be carried out there. The works are expected to cost £20,000, and will be under the direction and supervision of Mr. J. G. Poole, the surveyor to the board.

Mr. Thomas Glenister, of the Temple Chair Works, High Wycombe, has been elected mayor for the ensuing year, he being the first mayor connected with the staple trade of this thriving little town of chairs.

The new Union Infirmary, Coventry, is nearing completion, and is being warmed and ventilated throughout by means of Shorland's patent open fireplace Manchester stoves with descending smoke flues in the larger wards, and Shorland's patent warm-air ventilating Manchester grates in the smaller wards, the same being supplied by Mr. E. H. Shorland, of Manchester.

The top stones of a United Methodist Free Church were laid in Parade-street, Penzance, on Friday. Among those present were the architect, Mr. Oliver Caldwell, and the contractor, Mr. S. Nicholas.

At the annual meeting of the Royal Scottish Academy, held on Friday, Mr. E. A. Walton, of Glasgow, and Mr. T. Austen Brown, of Edinburgh, were elected as Associates.

A concert was given last (Thursday) evening by the members of the Architectural Association Lyric Club, at their new club-room, the Mona Hotel, Henrietta-street, Covent Garden.

To meet the growing necessities of the parish of St. Margaret's, Ilkley, it has been decided to erect on land situate between the Grove and the new railway to Skipton a Sunday-school and parish-room, plans of which have been designed by Messrs. Jas. and E. Critchley. It will be Domestic Gothic in style, containing a large parish-room, 82ft. by 40ft., with a series of six classrooms. The cost is estimated at £1,600. The corner-stone was laid on Saturday.

Our Office Table.

Sir Edward Guinness's gift of a quarter of million sterling, as a trust fund, to be expende in the erection of dwellings for the poorest the labouring population, is a munificent on recalling to mind the princely donations mad by George Peabody nearly thirty years ago. will be interesting to watch how the thre trustees succeed in solving the problem preventing persons of a better class tha that intended seizing all the advantage —hitherto the inevitable manner in whic all charities, schools, almshouses, and mod dwellings alike, have been perverted. Th crux is to erect and let at a remunerativ rent small, tenements, instead of many-storie blocks of barrack-like proportions. As we hav often pointed out, the cost of land is so high i the district where the poorest are segregated— and where, therefore, better and more cheerfu houses are most urgently needed,—that if a sub stantial percentage is expected to be returned i rent, many floors of rooms must be piled on above the other, and gardens, or even sun-lit well-ventilated open spaces are out of the ques tion. Four-fifths of the sum given by Sir E Guinness is to be expended in London, an the remaining £50,000 in Dublin, the aim being to provide, on a sound financia basis, clean and healthy houses for persons some what poorer than those who now avail themselve of the existing artisans' dwellings. The incom derived from the rents is to be reinvested so as t extend the work. The aim is a high and benefi cent one, and although in the light of pas experience we cannot hope that it will be fully realised, more good than evil may result fron the fresh experiment. We trust that cheerfulnes and comfort will not be sacrificed to pecuniary success.

The London County Council have lost no tim in considering the selection of a successor to th late Mr. Joseph Gordon as their engineer i chief. As was anticipated, the joint committe to whom the matter was referred, decided tha no process of re-advertisement was likely to bring before them for selection men of larger municipa experience or holding situations of greater im portance than those they had in July last. Th committee saw five engineers, and submitted t the council on Tuesday last the names of Mr F. E. Duckham (engineer to the Millwall Docks) Mr. J. W. Girdlestone (chief engineer of th Bristol Docks), and Mr. A. R. Binnie (enginee to the Bradford Corporation), and recommended "That Mr. Duckham be appointed chief enginee to the council at a salary of £1,500 a year, upo the following conditions:—That he do hold hi office during the pleasure of the Council; that h be required to give his whole time to the duties of his office, and be not allowed to take any private practice; and on retirement he shall not be entitled to any superannuation or pension." Mr. Burns protested against the recommendation, on the ground that Mr. Duckham's name had been brought forward by his relatives and friends, and provoked a scene, in the course of which Mr. McDougall admitted that he was a brother-in-law of Mr. Duckham, but denied that he had interfered in the election. It transpired that the voting in committee was originally a tie for Duckham and Girdlestone, and on a second vote Duckham 8, Girdlestone 7, and Binnie 1. After a heated discussion, the matter was, by a majority, referred back to the committee for re-consideration, an amendment, fixing the salary at £2,000 a year, being rejected.

Frederick Eliot Duckham, M.Inst.C.E., the candidate recommended by the joint committee, was born at Falmouth in 1841, and is, therefore, 48 years of age. After eight years' service with Messrs. Peto, Brassey, and Betts, at the Victoria (London) Docks, and a further period in charge of other dock and waterside operations, Mr. Duckham was appointed engineer of the Millwall Docks, upon their leaving the hands of the contractors in 1867. He superintended the equipment of that undertaking, and designed or developed most of the special appliances to be seen at the docks, notably the system for dealing with grain cargoes, and the movable hydraulic cranes now universally adopted, but which in 1873 had a representative in one made by Mr. Duckham. As an inventor, Mr. Duckham is perhaps best known for his

hydrostatic weighing machine, and for his pneumatic discharging dredger, which lands its 200 tons of mud in 20 minutes, and is said to save the Millwall Dock Company £3,000 per annum. Mr. Duckham was the originator of the business now carried on by the East Ferry-road Engineering Works Company, Limited. He joined the Institution of Civil Engineers as an Associate in February, 1875, and became a Member of that body three years later.

The full text of the petitions presented to the Privy Council by the architects of Scotland and by the Lord Provost, magistrates, and council of Edinburgh against the new charter of the Royal Scottish Academy has just been published. The former petition is signed by 223 architects practising in Edinburgh, Glasgow, Dundee, Aberdeen, and other towns in Scotland, and points out that the R.S.A. has done little or nothing to promote the advancement of the fine arts in Scotland beyond holding an annual exhibition, and since 1858 maintaining a school for the study of the living model; that the funds have only in a secondary degree been applied to the promotion of art, or to artistic uses; and that in particular since 1838 not more than five architects in all have been elected as members of the Academy, while at this present time there is not one practising architect among its members. That even in the annual exhibitions architecture has been persistently discouraged, the space allowed for designs being very small and most inconveniently situated; and that, in regard to teaching, the Academy has entirely failed to carry out its proper functions, no professors of either painting, sculpture, architecture, perspective, or anatomy having ever been appointed, and no schools of any kind are maintained, with the single exception of the life school. The second petition complains that, under the proposed charter, the funds will not be administered for the advancement of art or in the best interests of the public. The council of the Academy are preparing answers to the allegations in both petitions.

Robert Marnock, who has been characterised by Dean Hole, of Rochester, as the "most successful landscape gardener of our time," died at his London residence, Oxford and Cambridge-mansions, on Friday last, in his 90th year. He was born on the 12th March, 1800, at Kintore, Aberdeenshire. Nearly 60 years ago he was chosen as the curator of the Botanic Gardens at Sheffield, which he laid out so successfully in 1834 and 1835, that he was chosen to lay out the Botanic Gardens in Regent's Park just 50 years ago. The garden jubilee was celebrated last year. A large and increasing practice, the *Times* remarks, was the result, and few men have assisted so much in adding to the beauty of the public and private parks and gardens of this and other countries as Mr. Marnock. His work for Prince Demidoff at San Donato, near Florence, in 1852, added greatly to his reputation, and to the increasing taste for English gardening on the Continent. His latest public work in England was the Alexandra Park at Hastings, laid out some ten years ago. The latest private garden is that of Sir H. Peek, Rousden, near Lyme Regis, only just completed. That for Mr. Freshfield was carried out after employer and designer were both octogenarians. The gardens near London best known by Mr. Marnock's improvements are those of Sir Spencer Wells, at Hampstead, Mr. M'Henry, at Kensington, and Mr. W. H. Smith, at Henley. He also laid out Possingworth, in Sussex, for Mr. Lewis Huth. For the last five years he had spent the summer months with his two surviving daughters in a cottage on Deeside, but continued his professional consulting work until last spring.

All lovers of Perpendicular architecture will rejoice that Beverley Minster, although threatened with destruction by fire, has been preserved from that disaster. On Friday evening sparks were seen to issue from the roof of the chancel of the grand minster, probably the noblest ecclesiastical fabric in England not yet raised to cathedral rank, and an alarm was at once given. On the roof being inspected, it was found that one or two of the massive beams had been burnt through, but the smouldering mass was extinguished. The fire had been caused, as usual, by plumbers working on the roof. Rickman, in his "Gothic Architecture," well remarked: "What the west front of York is to the Decorated style, that of Beverley is to the Perpendicular, with this addition—that in this front nothing but one style is seen—all is harmonious."

An important geodetical work has just been carried out in Spain. It was deemed desirable to revise the former survey connecting France and the Peninsula, carried out in 1863, mainly with the view of making the connection between the Spanish and the North African survey as nearly perfect as possible. The French portion of the survey made in 1863 was under the superintendence of Leverrier, and the Spanish portion under that of Aguilar of the Madrid Observatory at the Retiro. On the present occasion M. Bassot, of the observatory at Montsouris, has superintended the French work, while Senor Aguilar has again conducted the Spanish survey. Paris and Biarritz were the terminal points for France; Biarritz and Madrid for Spain. The two observatories were connected by a direct telegraphic wire for the special purpose, and identical apparatus of every kind was employed throughout the whole of the operations. The results were most satisfactory, and went to prove the great care with which the original triangulation was carried out. The relative positions of Paris and Madrid may be regarded now as definitely ascertained, the latter place being, as to time, 24min. 6sec. later than the former.

Mr. I. P. Mendoza has opened in his King-street Galleries, St. James's, a select and interesting exhibition of drawings in black and white. This is the seventh annual gathering of works thus brought together, and if we cannot say the collection exceeds its predecessors, the pictures as a whole rank as a good average. Among the architectural studies shown in the room are two by Mr. F. P. Barraud, one from Rouen, showing the entrance to the north transept, and a street scene in York, near St. Peter's Gate, with the Cathedral towers seen over the gabled houses. A scene in Alexandria, by Mr. John Varley, is a delicately-finished Indian-ink water-colour; and Mr. T. R. Macquoid treats us to a picturesque study "In the Alhambra." Miss Alice Squire sends "The Little Grey Church," and Miss Marion Logsdail shows how a lady can treat architectural subjects in the pen-and-ink sketches of St. Mary-le-Wigford Church, Lincoln, the south porch, Lincoln Cathedral, and the Jews' House in the same city, as well as the 15th-century house (No. 77) hard by. Mr. C. Holliday hardly does the Temple Church justice by his etched interior (128).

Mr. Hainsworth, the building inspector to the town council of Leeds, has presented his annual report of the work done in the borough in his department. It shows that during the twelve months the plans of 2,253 new buildings have been submitted for approval, of which 2,010 were approved, while there had been 867 additions and alterations of buildings. During the year 1,571 houses had been completed and certified for occupation. Only four informations for infringement of the law had been laid, and convictions obtained in each case.

The Electric Light Supply Corporation, in erecting their new works at Deptford, constructed a boundary wall which, though it was claimed to be safe, did not entirely comply with the Metropolitan Building Acts. The General Steam Navigation Company, whose premises adjoin, took proceedings to compel the Electric Light Company to reconstruct the wall, involving, it was said, an outlay of £4,000, and Mr. Baron Huddleston and Mr. Justice Mathew issued a mandamus for that purpose. An appeal against that order was argued on Tuesday before the Master of the Rolls and Lords Justices Lindley and Lopes, the nominal defendant being Mr. J. R. Redman, district surveyor for North-East Deptford. Their lordships said that unless the parties came to an agreement, they would give judgment in a fortnight.

Dr. Tristram, as Chancellor of London Diocese, granted, on Wednesday, a faculty authorising the vicar and churchwardens of St. Saviour's, Fitzroy-square, to sell by public auction two pictures by Benjamin West, and to devote the purchase money to the church-repair fund. Till recently the pictures hung in the church; but since the building has been restored and whitewashed internally, the parishioners have thought the works unsuited to their position.

The freedom of Dundee will be presented to Mr. Arrol, contractor for the Forth and Tay bridges, on Wednesday, 4th December. The ceremony will take place in the Albert Hall, and afterwards Mr. Arrol will be entertained at a banquet in the town-hall.

MEETINGS FOR THE ENSUING WEEK.

Monday.—Royal Academy. "Chemistry," No. 4, by Prof. A. H. Church, F.R.S. 4 p.m.
Surveyors' Institution. "The Tithe Question," by E. Ryde, past-president. 8 p.m.

Tuesday.—Society of Architects. "The Present Worth of Architecture as a Serious Life's Pursuit," by G. F. Terry. 7.30 p.m.
Institution of Civil Engineers. "Water Tube Steam-Boilers for Marine Engineers," by J. I. Thornycroft, M.Inst.C.E. 8 p.m.

Wednesday.—Society of Arts. "Scientific and Technical Instruction in Elementary Schools," by J. H. Gladstone, F.R.S. 8 p.m.
St. Paul's Ecclesiological Society. "Flemish Brasses in England," by A. Oliver. 7.30 p.m.

Thursday.—Royal Academy. "Chemistry," No. 5, by Prof. A. H. Church, F.R.S. 4 p.m.

Friday.—Architectural Association. "The Decoration of Churches," by E. Pridham Warren. 7.30 p.m.
Institution of Civil Engineers. "Principles of Iron Foundry Practice," by G. H. Sheffield, Stud.I.C.E. 7.30 p.m.

Architectural Association, 9, Conduit-street, W.—November 29th. Paper by E. P. Warren, Esq., on "The Decoration of Churches." 7.30 p.m.

CHIPS.

At a meeting of the local board of Cleckheaton, held on the 14th inst., the amended plans for a town hall, submitted by Messrs. Mawson and Hudson, of Bradford, the successful candidates in the recent competition, were adopted, and it was decided to invite tenders. The estimated cost of execution is £12,000.

At Bucks Assizes, at Aylesbury, on Monday, before Mr. Justice Wills, Henry Montagu Chadwick, described in the calendar as an architect, was sentenced to six years' penal servitude for sending a letter demanding money by threats to his aunt, Mrs. Mees, housekeeper to Lord Carington, at High Wycombe.

The Derby Town Council are resolved to promote next session an Extension Act, which will, by bringing outlying districts, more than double the area of the town, and increase its population by about 10,000 and the rateable value by about £70,000. The principal places proposed to be annexed are Alvaston, Littleover, Normanton, and Spondon.

The County Council caused Messrs. Simmonds Brothers, of Newton-street, Holborn, to be summoned to the Westminster Police-court on Friday for the fee and expenses of their district surveyor, Mr. W. A. Large, who had condemned a structure that the defendants had erected near Lowndes-street, Belgrave-square, for a celebration of the marriage of the Duke of Portland. The defendants had already been prosecuted and fined for putting up the building without previously obtaining permission. The magistrate thought that, as the building proved sufficient for the purpose, when completed, the district surveyor had acted too hastily, and, in dismissing the summons, he allowed the defendants' costs.

The foundation stone of the new parish church for Plaistow was laid by Miss Claughton last week. The church is being erected from designs by Sir A. W. Blomfield, A.R.A.

Ferdinand Heilbuth, the painter, died in Paris on Wednesday. The son of a Jewish rabbi, he was born at Hamburg in 1826. After a visit to Rome he settled in Paris, studied under Gleyre, and for years exhibited historical figures. During the war he went to England, and on his return devoted himself still more successfully to scenes of outdoor life, both in oils and water-colours.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

Bath.—For the laying of mains throughout the city during the ensuing six months, for the city council:—
Birth, Bath (accepted).

Bromley, Kent.—For works of surface drainage in Beckenham-lane, for the Bromley Local Board. Mr. H. S. Cregeen, surveyor:—

Peill, E., and Sons	£175 0 0
Lansbury, T. (accepted)	164 18 9

Surveyor's estimate, £170.

Catford.—For residence at Catford, for Dr. Hammersley (exclusive of decorations). Mr. H. Hopton, High-street, Lewisham, architect:—

Kennard	£2,700 0 0
Laird	2,269 0 0
Lowe, Chislehurst (accepted) ...	2,174 0 0

Cullompton.—For alterations and additions to Bridge Mills, near Cullompton. Mr. A. H. Wills, 2, Higher Belmont-road, Exeter, architect and surveyor. Quantities by architect:—

Philips, Exeter	£3,800 0 0
Dart, Crediton	3,300 0 0
Gibson, Exeter	3,090 0 0
Salters, Exeter	2,873 0 0
Vanstone, Paignton	2,847 0 0
Gooding, Exeter	2,755 0 0
Westcott, Exeter	2,727 0 0
Pratt, Mary's Clyst (accepted) ...	2,654 0 0
Rowse, Plymouth	2,492 0 0
Ellacott and Co., Plymouth ...	2,330 0 0

Holloway.—For new entrance and staircase to billiard-room at the Cock Tavern, 596, Holloway-road, N., for Mr. F. Hall. Mr. A. J. Perriam, 52, St. John's-villas, Holloway, N., architect:—

Evans, W. (accepted)...	£272 0 0

Hornsey-lane, N.—For additions to dairy farm, Stanhope-road, Hornsey-lane, N., for Mr. J. F. Spencer. Mr. H. S. Tyack, 6, Duke-street, Adelphi, architect:—

Mattock Bros.	£779 0 0
Hayworth and Sons	697 0 0
Burman and Sons	690 0 0
Kessels, P. M.	626 8 0
Voller, F., Truro-road, Wood Green*	579 0 0

* Accepted.

Kingston-on-Thames.—For the Hook, Southboro', and Long Ditton Sewerage. Mr. W. H. Hope, engineer:—

Neave, J. W. and J.	£13,895 6 6
Neave, W., and Son	13,819 18 9
Holme and King	13,211 11 10
Adams, T.	12,977 1 7
Mackay, J.	12,561 18 8
Bottrill, W. J.	12,555 0 0
Iles, E. and W.	11,899 0 0
Kavanagh, S.	11,575 1 11
Bottoms, L.	11,332 0 0
Cooke, B., and Co.	10,579 0 0
Cunliffe, W.*	10,421 0 0

* Provisionally accepted.

London, S.E.—For additions to factory, Valentine-place, Blackfriars-road, for Mr. J. Pascall. Mr. W. H. Woodroffe, architect:—

Colls and Son	£3,954 0 0
Higgs and Hill	3,930 0 0
Smith and Son	3,847 0 0
Downs, W.	3,831 0 0
Hall, Beddall, and Co.	3,774 0 0
Hoare and Son	3,740 0 0
Wall Bros.	3,677 0 0
Parker, G.	3,550 0 0
Outhwaite and Sons (accepted) ...	3,485 0 0

London.—For the erection of central offices, for the Institute of Chartered Accountants in England and Wales, at Coleman-street Buildings, Moorgate-street, E.C. Mr. J. Belcher, F.R.I.B.A., architect. Quantities by Mr. R. C. Gleed:—

Dove Bros.	£26,145 0 0
Foster and Dicksee	25,057 0 0
Cubitt and Co.	24,670 0 0
Downs	24,620 0 0
Greenwood, J. and J.	24,560 0 0
Hall, Beddall, and Co.	24,215 0 0
Colls and Sons	23,940 0 0
Perry and Co.	23,534 0 0
Bissett and Sons, Sheffield ...	22,996 0 0

Leamington.—For laying an installation and electric fittings to the swimming bath, for the town council:—

Rooper and Tozer (accepted)... ...	£86 0 0

Newport, Mon.—For the erection of one block of model lodging-houses in Dock-street, Newport, for the Newport Model Lodging-House Co. Mr. E. A. Lansdowne, High-street, Newport, architect. Quantities by the architect:

Francis and Son	£2,950 0 0
Parfitt, H. C.	2,670 0 0
Gadwell, Exors. of Messrs. ...	2,550 0 0
Linton, W. A.	2,548 0 0
Blackburne, W.	2,495 0 0
Linton, J. (accepted)	2,460 0 0

All of Newport.

Newport, Mon.—For the erection of two small cottages at Panteg, for Mr. F. Phillips. Mr. E. A. Lansdowne, architect:—

Burgoyne, J., Pontypool	£340 0 0
Morgan and Evans, Pontypool* ...	327 0 0

* Accepted.

Newport, Mon.—For the erection of two cottages, with house and shop on Llanover Estate at Newbridge, for Mr. J. Griffiths. Mr. E. A. Lansdowne, architect:—

Morgan, C., Newbridge (accepted)...	£750 0 0

Nottingham.—For the erection and completion of semi-detached villa residences, situate on the Gregory Boulevard, for Mr. Alderman Blackburn. Mr. G. S. Doughty, C.E., 14, Fletcher-gate, Nottingham, architect:—

Bell and Sons...	£2,367 0 0
Dennett and Ingle	2,344 0 0
Emerson and Franks	2,313 0 0
Cuthbert, T.	2,220 0 0
Gilbert and Gabitass	2,205 0 0
Adams, J. J.	2,200 0 0
Cooper, J.	2,195 0 0
Hind, E.	2,157 0 0
Barlow and Whittaker	2,150 0 0
Clark, J. H.	2,068 0 0
Keeling, B.	2,058 0 0
Turton, J., Old Basford (accepted)	1,956 0 0

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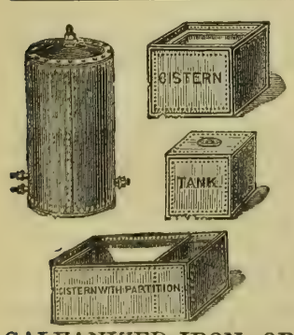
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LORD GRIMTHORPE'S OWN DRAWING
& DESIGN FOR ST ALBANS ABBEY
WEST FRONT

Sir E Beckett's design of Feb 1879 with more details, which he means to follow subject to any variation of details which may be found expedient. These outlines will be adhered to & the two stones of gargoyles.
Copy sent to Bishop 24 Nov: sent to Chapter (Clerk thereof) 26 Nov: laid before committee with the above condition written thereon 5 Dec 79: & by them to Rector & Church Wardens soon after.

Details omitted & their undetermination Scott's estimate for repairs roof & glass

54'

33½

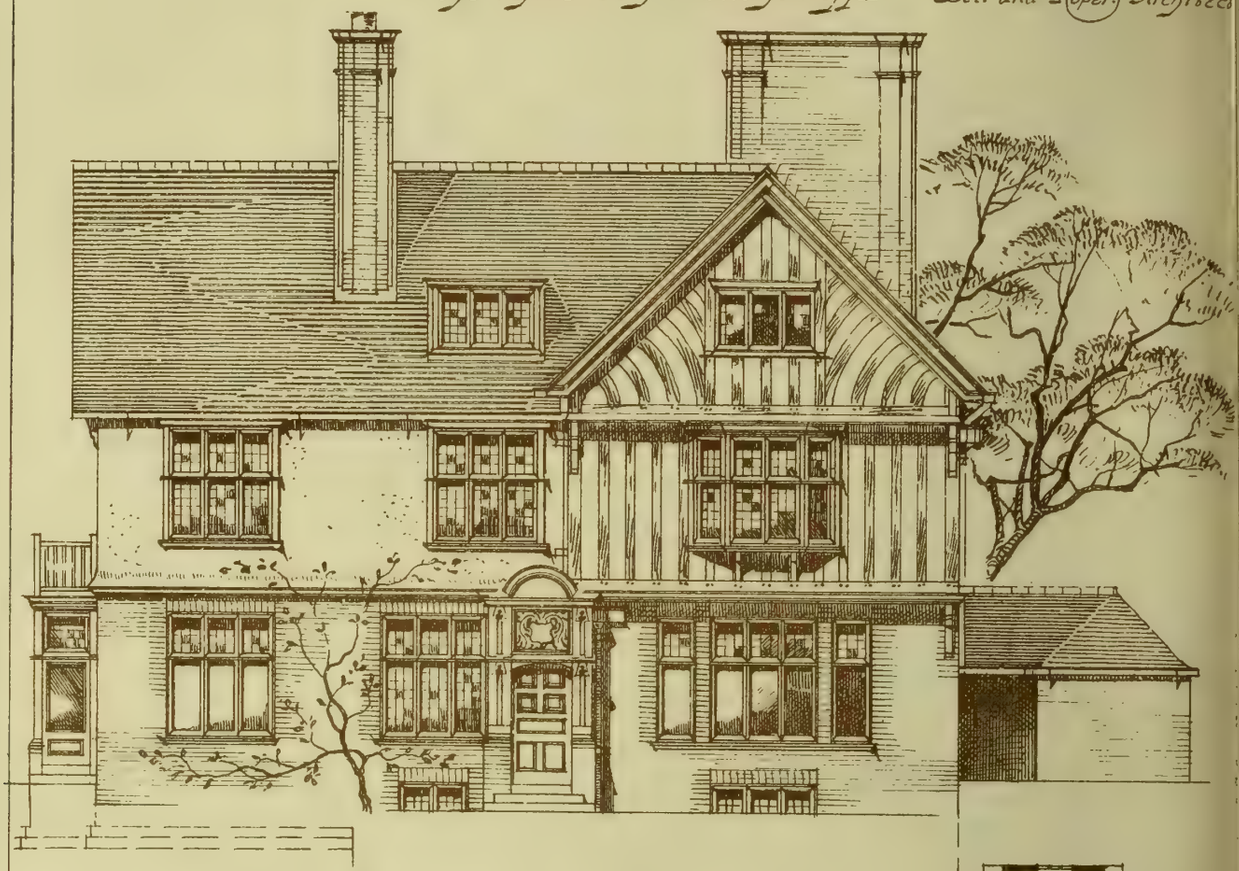
71' Scott

Inch Scale

LORD GRIMTHORPE'S DESIGN
FOR THE TREATMENT OF THE CRUCIFIX SPACE
ON THE HIGH ALTAR SCREEN
ST ALBANS ABBEY SEPT 1884

HOUSE NEAR SHEFFIELD

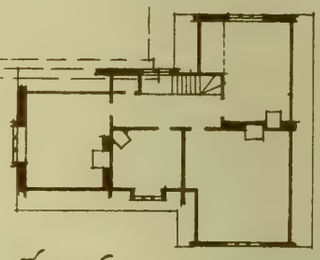
the residence of R. Watson Esqre *Bell and Roper Architects*



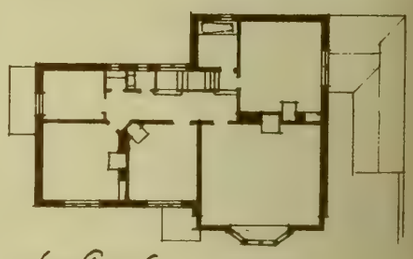
South East front



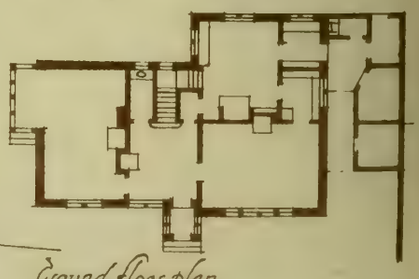
South West front



Attic plan



first floor plan



Ground floor plan

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THE·DINING·HALL·OF·THE·CHARTERHOVSE·E·C· FRED·WILKINSON·DEL·

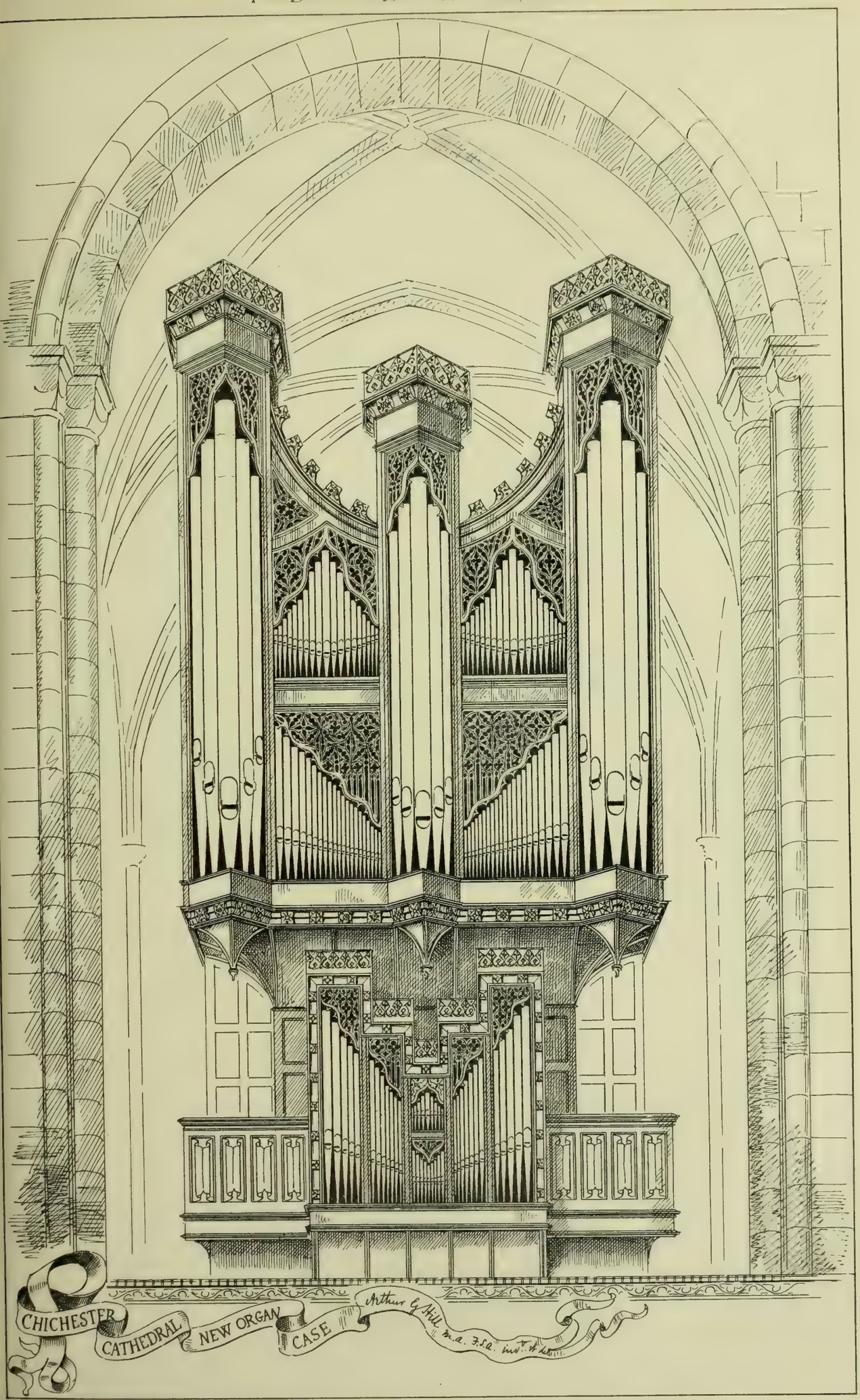
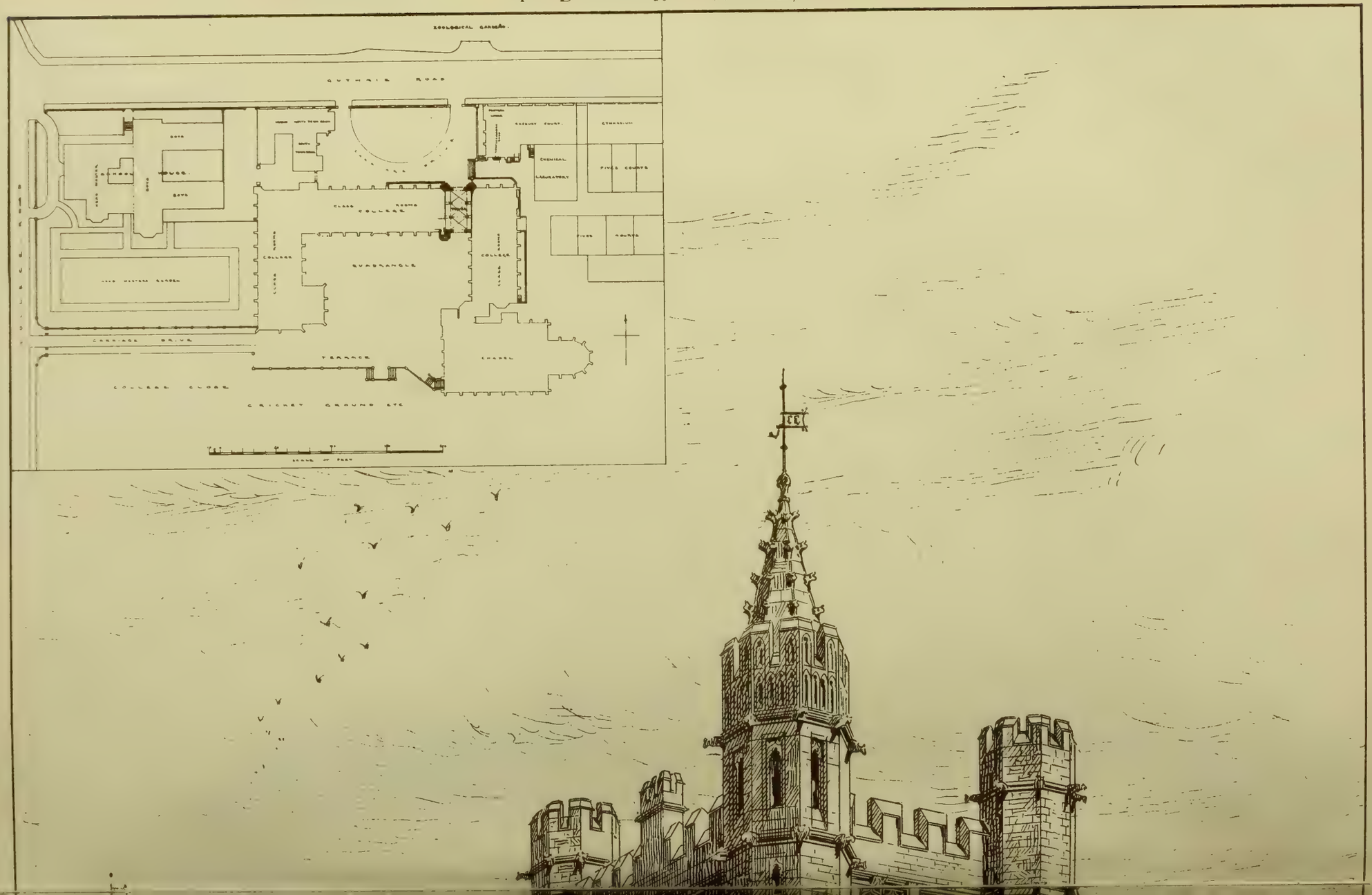


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ZOOLOGICAL GARDENS
CHEMICAL LABORATORY
CLASS ROOMS
COLLEGE
QUADRANGLE
CHAPEL
CARRIAGE DRIVE
TERRACE
COLLEGE CLOSE
CRICKET GROUND ETC



THE TOWER

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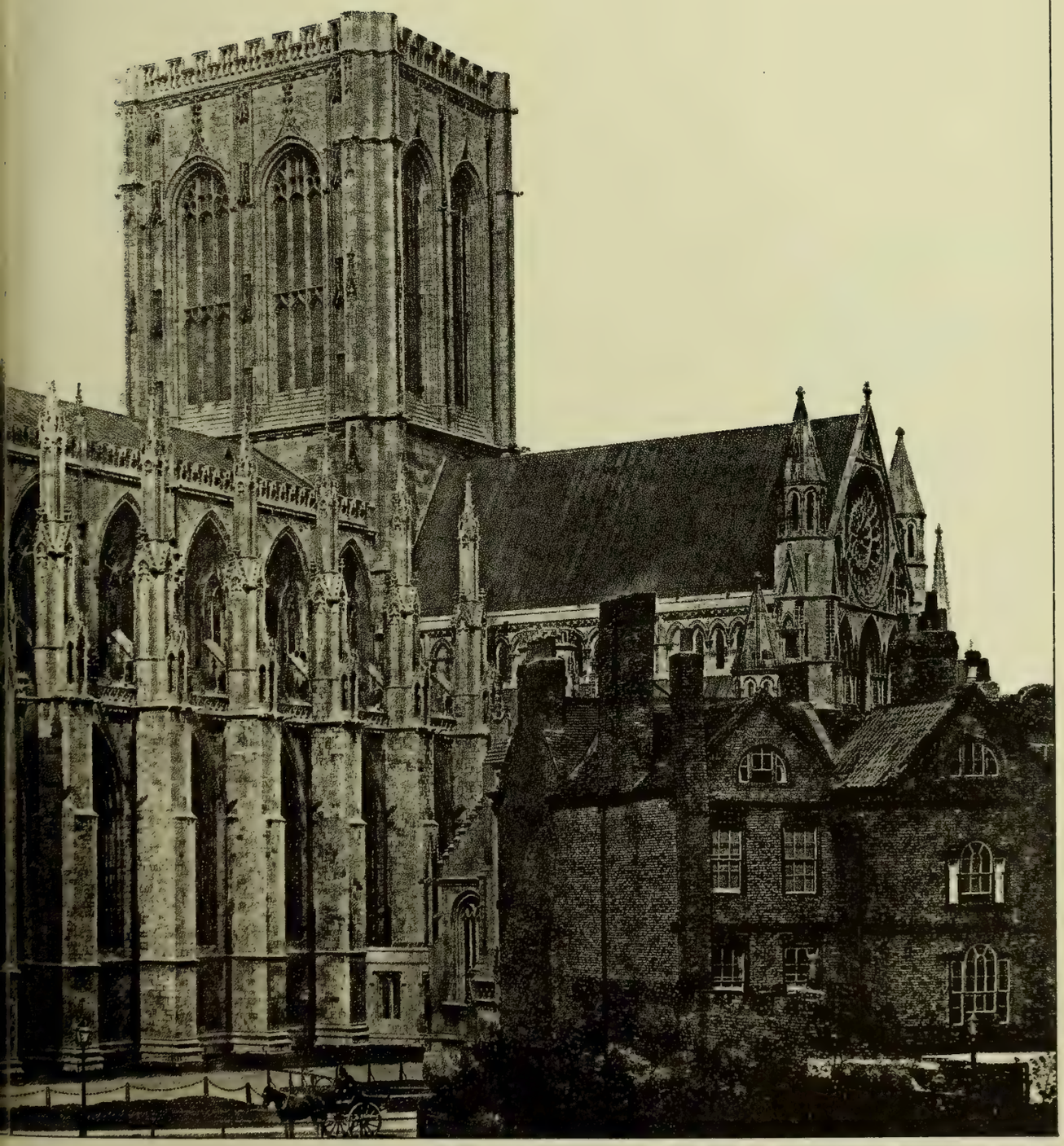
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YORK MINSTER.

SOUTH WEST VIEW.



"PHOTO-TINT" by James Akerman 6 Queen Square London W.C.

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1821.
FRIDAY, NOVEMBER 29, 1889.

THE SCHOOL BOARD SCANDAL.

SUCH a series of blunders, failures, and accidents as those that have befallen the London School Board may well arouse the suspicion and indignation of the overtaxed Londoner. Unexplained, these misadventures will go far to discredit the opinion that the school buildings in the Metropolis are sound and substantial structures, and will lead to inquiries that will tend to increase the public impression of mismanagement. From the reports that have been published, and the disclosures made at the meeting of the London School Board, other allegations are likely to arise. Mr. John Lobb, whose inquiries have elicited from the Board many defects in the buildings, has recounted several very serious cases of irregularity which have been discovered in schools erected by some of the thirteen firms of contractors who have carried out the construction of nearly all the buildings in recent years. The question put by Mr. Lobb to Mr. Helby, the chairman of the Works Committee of the Board, has disclosed the fact that inferior materials have been used in the construction of the schools, costing over £2,000,000; that many of the firms employed have sublet their contracts and paid wages below the minimum rate. Replying to another question, the chairman of the Works Committee also stated that Salter's Hill School, West Norwood, has been shored up to prevent its falling—at least, that portion of the building lately added—fractures having shown themselves in the walls, owing to the fact that the foundation of the gable wall was made over an old drain, which had given way under pressure. The Woodland-road School, Upper Norwood, built nearly four years ago, had been raised in the course of erection, and the terms of the specification are asserted to have been departed from. The mortar used is said to resemble mud, and the brickwork was built with this inferior mortar, which contained no grit, while a quantity of burnt and half-burnt clay was used instead of sand. The officer for repairs stated in his report, also, that the walls were not flushed up as specified, the mortar crumbled into fine powder, the external facework contained soft bricks, the parapet and gable walls were not built in cement as specified, the bricks were loose—indeed, the mortar has so crumbled away that the brickwork will soon have to be repointed. The stone, instead of being the best Portland set on its natural bed, is inferior, full of shakes and sandholes, and the natural bedding has not been adhered to. The roofs, specified to be covered with the best Broseley tiles, to be nailed with two long zinc nails, are only hung with one 1½ zinc nail to each tile, the gutters are laid with 6lb. lead instead of 7lb., the skylights are leaky, the lead pipes are only 1¼in. instead of 1½in. as specified, and their weight of considerably less per yard than intended. Several other defects are enumerated; the pipes in the ground, specified to be 3ft. below the surface, and to be laid in a box filled with tar, are found to be only 18in. below the surface, and laid in boxes without a top and without tar; the branch pipes have no box; the sawdust protection in the pipes above ground has not been given; the paintwork is inferior; ceilings are cracked and loose; the pointing round frames is loose, without hair; the glass is 21oz. instead of 26oz., as specified; there is no concrete under the boarded floor to cover the wet clay, wet rot has set in, and holes are found in the boards. The floors will have to be taken up, concrete laid, and air bricks inserted in the walls. The plastering is falling from the walls owing to want of key; wall-paper is loose. These are some of the defects found in the case of the latter school. Mr. Helby and the architect confirm this report, and the clerk of works in charge of both schools has been recommended to be dismissed. Messrs. Howell and Co. were the builders for the enlargement of Salter's-hill School, and Messrs. Wall Brothers the builders of the Woodland-road School. The former have since become bankrupt; but we are glad to call attention to Messrs. Wall's letter in another column denying in detail and seriatim certain charges made in the report.

We have been quoting from the report of the superior officer for repairs, who says that any disturbance of the clay upon which the buildings are erected may produce serious results. Rain penetrates the walls of the school-keeper's house, and the "damp-course being below the level of surrounding tar pavement, damp rises in the walls." The air-bricks are deficient in number and half buried. We understand there is an action pending against the contractors for defects at the Kilburn-lane School, and the Works Committee have recommended that the firm be called upon to remedy the defect in the Woodland-road School, and in default to take legal proceedings against them. Again, referring to the Salter's-hill School, the report made by the superior officer for repairs is borne out by what we have ourselves seen. The cracks appear in the newly-built gable end of the schools which projects in front of the older part of the building facing Salter's-hill. One serious fracture occurs over a wide arched window on the ground floor and extends through to the next story, showing that the pier on this side had settled owing to a bad foundation. We found the ground opened along the whole front and a drain exposed. It is now seen that immediately under the concrete was a 6in. drain running along the whole length of wall, which has yielded to pressure and given way; some pipes are broken and the drain is choked, the water has therefore been soaking into the clay upon which the wall stands. The lower portion of the gable end has been shored up by short shores, and at each angle, previous to underpinning the wall with Portland cement concrete down to a good foundation. The cost of this work is estimated at about £50. In this gable end, which is lofty, there are two tiers of windows, which are wide, and the corner and centre piers have to support a considerable weight. The struts which are erected are placed to support these piers and the pilasters over. The report of the same officer on the Woodland-road School minutely enters into the alleged defects. In addition to those mentioned, we find reference made to an unfinished chimney-stack and a coped wall that must be rebuilt. Four large window-sills, jamb stones, all curb stones under railing which are without dowels are recommended to be taken out and replaced with others of a proper description, and a zinc flat relaid.

Other school buildings have been found equally defective in construction and sanitary condition. We hear of schools at Hammond-square, Hoxton, alleged to have been partly built over a cesspool; defects of lighting and ventilation in Curtain-road School, Shoreditch; cracks in a school at Broad-street, Ratcliff; bad foundations in another school at Tower Hamlets; buildings at Stepney, Netherwood-street, Saunders-road, Dagleish-street, Ricardo-street, Plassy-road, Catford, and we know not in how many others. We may well believe with Mr. Diggle, in his electioneering address of October, 1888, that past Boards have paid for a depth of foundations for schools which do not exist, and have been charged and paid for materials under the pavements that do not exist, that in respect of bricks, mortar, woodwork, lead, zinc, and glass the specification requirements have not been observed. These irregularities have been known for some time past. So long ago as October, 1887, a committee was appointed to investigate and report upon the existing arrangements of the Works Department. Certain defects were discovered in one school; the foundations were found to rest on soft loam, in another case upon made ground very loose and soapy, in another upon ashes, and another had no foundations. Here the inquiry rested for some time till a new Board came in; the evidence was withheld from the public owing to the Board's desire not to alarm them, and because of an action against the Chairman of the Works Committee. Other difficulties arose upon the relations between the late architect and other officials and the School Board. Much light will be thrown upon these matters when the Committee's report is published: but the Board appear not to be in a hurry to make known facts which may involve new responsibilities and difficulties. If what we hear is true, that about three-fourths of the London School Board buildings are badly constructed, we cannot wonder at the desire to withhold facts that are manifestly unpleasant.

The question everybody asks is on whom does the responsibility rest, the Board for sanctioning an arrangement that has worked so badly, the architect who has the control and supervision of the buildings, or the contractors engaged? Till the matter is fully sifted it is impossible to answer this question. Counsel's opinion having been consulted in one case, it was to the effect that the builder alone must be made responsible. Upon this opinion the Board's action appears to have been shaped. The investigation at first seemed to point to a clerk of works, against whom proceedings could not be taken, because he had been removed by death. With regard to charges that have been made reflecting on the honesty of officials, we say nothing, as these have to be investigated by the proper authority. What has been proved is that the work performed in the building of these schools has been shamefully done, and that the specification has not been followed. Mr. Ewan Christian, in a report last year, says: "Some of the most unsatisfactory evidence that has been given during your inquiry has related to the shamefully dishonest manner in which the foundations have been dealt with." Reference was made to the Queen's Head-street School, Islington, built by a bankrupt contractor, where a fracture had taken place at one corner. Other reports refer to the bad materials permitted to be used, as in the Netherland-street School, where the mortar was found to be devoid of lime; to inferior materials and workmanship. The supervision appears to have been seriously in fault in the earlier buildings. So defective was the condition of one building that a motion was made requiring the late architect to put it into a proper state of repair at his own expense; but a subsequent amendment to refer the matter to counsel's opinion led to the builder being held responsible.

Sanitary defects have been discovered in several of the schools. In one of them the drains were found to be "in a very deplorable condition"; the pipes were not jointed, and in some cases did not even meet; the connections were faulty, and allowed the drainage to percolate the ground; the main was carried underneath a class-room. Mr. Perry, the superior officer of the Board, comes to the conclusion, from his observations, that in some cases the original drains were faulty in their planning, and rendered worse by bad laying. From these instances of scamped work, especially in the concrete foundations and drainage, there seems to be evidence either of culpable negli-

gence on the part of those employed to superintend, or that the clerks of works had more to do than they could properly look after. How else can we account for the mass of rubbish thrown into the trenches of foundations, and covered over with concrete, as in the Ricardo-street School, or drains laid without proper jointing and connection? These are matters that will have to be cleared up. It is easy, however, to make the clerk of works a scapegoat, as one writer remarks. A carefully-prepared specification is placed in his hands and a set of drawings; but should these contradict one another, the clerk is driven to use his own discretion unless he makes an appeal to headquarters. It is, of course, unreasonable to suppose that an architect to the Board can inspect every building and detect faults of scamping everywhere, or that the clerk of work can always be present to see that every yard of concrete is properly mixed and deposited; but in these discoveries of unscrupulous workmanship the public have a right to the opinion that ordinary care and watchfulness have not been exercised.

In the mean time, the Works Committee are busy in ascertaining facts. Their labours are limited to those schools built during the last four years, about which the superior officer has been making reports. The builder's liability being limited to four years, those buildings erected before that time are exempted from this ordeal, although doubtless many of them are very defective, and will become costly in repairs. In investigating the causes which have led to the wholesale scamping of our Board schools, the system of contracts that has been in force cannot be overlooked. The select few who were allowed to compete, and have carried out the bulk of the schools, include many men of known integrity; but the course adopted was not calculated to insure general confidence. The free contract list was adopted; but responsible builders were shy to enter into competition, because they knew the Board would accept the lowest tenders. The Board are now accused of adopting the sweating system, and we are afraid that, in the past, this policy of accepting the most favourable tender has led to the results we have mentioned. Much of the work has been taken at unremunerative prices, and the ratepayers have to pay heavily in consequence.

THE ROYAL SOCIETY OF BRITISH ARTISTS.

THE Galleries in Suffolk-street continue to maintain the improved standard which they have done for the last few years. The large room is pretty full of meritorious work, from F. Brangwyn's noble and pathetic canvas "Ashore" (408) and Wyke Bayliss's "Interior of Certosa at Pavia" (305), to the charming bits of woodland by Jas. E. Grace. We cannot say that G. F. Watts's large picture, "B.C."—though the work of a Royal Academician whose genius and power as a painter of the highest class of subjects have given him a world-wide celebrity—is an ornament to the gallery, nor will do much to add to the reputation of the venerable painter. The subject may be mistaken for a study of our first parents as Nature had endowed them—naked, guileless, sitting on the sea beach, the man with a shell in his hand, trying to convey his meaning to the woman, who leans forward to catch the sound, and who wears a primitive necklace of beads and shells. More probably the artist here represents the type of an aboriginal pair, in their barbarian state and primeval condition; the figures are well drawn, but there is a coarseness and sensuousness about the subject. H. T. Schafer's "Unveiled," a nude figure of a female, has some delicacy and colour; the pose is graceful. W. H. Pike, whose Venetian scenes and crowded market-places are well known, sends several cleverly-painted groups of figures full of animation and colour. "The Conjuror" (449), "Snatchers-up of Unconsidered Trifles in the Campo della Braccla, Venice" (534), and "Merriment on the Rialto" (597) are full of character and action. We cannot think the introduction of "Della Robbia's Greeting in the Interior of the Certosa" (305) happy or appropriate as an incident. Heaviness of detail, especially in the capitals of the pillars, and a too spotty look, detract from the merit of this interior, and Mr. Wyke Bayliss is more himself in the splendid drawing of the interior of the Duomo, Siena (270), in the water-colour room—a work of surpassing beauty in the jewel-like effect of its radiant light and colour. In "The Painter's Litany, in the Monastery of S. Maria degli Angioli, Lugano" (542), Mr. Bayliss has put on canvas the grand painted Litany of the Cross, Passion, Resurrection, and Ascension of our Lord, in this church, which occupies the circular wall-end from vault to arcade, and his mystical pencil could hardly have chosen a more fitting subject than that described in this Litany. Landscape, in the hands of Alfred de Breanski, is always fresh and vigorous; his large view of "Exmoor" (299) is a fine piece of moorland. W. Ayerst Ingram, Leopold Rivers, H. Hollingdale, Anderson Hague are all here, and show masterly works in their different manners. "A Surrey Landscape" (307) is broadly and sympathetically painted, and there is a poetic power in the little grey picture of a windmill (319), by W. Hollingdale. Stuart Lloyd, in "Quay at Dittisham" (298), paints one of his tranquil evening effects, always pretty in composition if a little tame, and we must note the vigorous work and light in Anderson Hague's "Cornfield" (347). Delightful tone and feeling touch charm us in Jas. G. Grace's "Evening Gleams" (314), and its companion picture, "The Sunset Hour" (384)—graceful studies of woodland.

Figure subject and *genre* painting find clever handling in the work of Haynes King (318), a girl seated; in H. G. Glindoni's humorous subject, "The Wrong Move"—two elderly gentlemen playing, one of them accidentally displacing his wig, to the amusement of his companion; also in Laslett J. Pott's "The King and his Master" (339)—Henry VIII. walking in a garden with Cardinal Wolsey, the latter in earnest converse; while behind are a jester sitting on a balustrade and ladies of the Court. A strong note of colour is the cardinal's scarlet robe, and there is good drawing in the figures and accessories. Other works of this class are "A Jacobite Spy in the Pillory," by T. Davidson; G. E. Hick's study of a fisher-girl—an open, bright-eyed lass, mending net (342); W. D. Almond's "A Connoisseur" (394); F. Hamilton Jackson, classical figure subject (400), a brilliant and cleverly-composed picture. "Lady Castlewood visits Henry Esmond in the Gatehouse Prison" (405), by R. J. Gordon, is an incident told by Thackeray in his "Esmond," where the heroine, a type of womanly beauty, is asking Esmond where her husband is. Esmond sits on a narrow bed in a dark cell, his face buried in his hand, one arm in a sling. The situation is intensely tragical. Lady Castlewood stands attired in deep black, but a little too dramatic in pose and action as she looks at Esmond and demands an explanation. There is a womanly air of defiance in her attitude; the light on face and hands of her delicate and graceful figure is cleverly done, but the youth looks more like a man. Of coast and seascape, John Fraser's "Trawlers in Seaford Bay" (357), V. P. Yglesias's "Waiting for Tide, Scarboro" (391), and F. Cayley Robinson's effective piece of sea-painting, "Homewards" (429), must be noticed—the two latter especially. The handling is almost Dutchlike in its atmosphere and luminous effect, the figures and distance admirable in grouping and perspective. Some clever work is seen in Jas. Clark's "Rehearsal" (370) and T. Schafer's "Where the Rye Grows High" (378). H. C. Fox's "Old Home" has an unaffected charm, and is broad in handling of the masses of cotrages and foliage. "Ashore," by F. Brangwyn, we have already noted as one of the best painted pictures, full of stirring incident, and remarkably powerful in its grasp and handling. The stalwart-hearted sailors are in the rigging, and have become aware of their perilous situation. The large landscape of R. W. A. Rouse, "October," is too spotty—there is want of breadth. F. S. Spenlove's winter landscape (406) is more pleasing, and we must note the work of J. H. Snell (414), a marshy swamp at dusk. F. Wyman's "Roses," A. W. Strutt's "Ploughing" (422) Oliver Rhys' "Bead Stringer," T. Roberts's "Brookside" (450), "The Thames from Greenwich Park" (480), clever as a study of atmosphere and light; G. Sherwood Hunter's "Volendam Pilgrims" (483) has a dexterously painted effect of Chinese lanterns in a procession. Above this picture is W. Strutt's mythical subject, "The Fury of Achilles," where the revengeful Greek is dragging the bleeding body of Hector behind a chariot, is decorative in scheme—the horse and chariot are full of life and animation. We must also note with commendation the pictures of coast and sea by W. H. Y. Titcomb (490), Adam E. Proctor's "Cornish Homestead" (488), P. H. Calderon's pretty study of girl reading, "An Old Romance" (511); Robert Morley's humorous and clever study of monkeys, "The Hairdresser" (578); A. Ludovici's "The Day of Recreation" (525); the sunlight effect of F. Brangwyn's "Spinning Yarn" (550)—a wonderful piece of naturalistic painting. Other oil pictures include a landscape by H. Zimmerman, in which the evening effect and wooded bank are tenderly treated; a rather attenuated full-length portrait of lady by Hubert Vos (590); a few clever subjects by W. H. Pike and Alfred Hartley; and a vigorous subject by Flora M. Reid, "A Cornish Village," study full of character; and studies by R. J. Gordon, Kathleen Shaw, and Helen Cridland.

The water-colour drawings and studies are, as usual, fairly strong. There is an effective view of "Whitby Abbey" by Bernard Evans (12); a delicately-painted face of girl in hat, the reflected light on which is worthy of Reginald Barker's pencil; a luminous atmosphere and blue sea are well rendered by Nelson Dawson (22). Touching in sentiment is Carlton A. Smith's "A Passing Cloud." Jas. Macmaster's "Village by the Sea" (30), and B. L. Bruhl's "Herne Bridge on the Wye," are both picturesquely-handled subjects. Clever, too, in workmanship is Henry Sykes's "Sport," passing which, Arch. Webb has a nicely toned evening subject "Off Rotterdam" (65), Chas. Cattermole a sketch "Betrayed" (64). W. Harding Smith sends a clever drawing of interior, the Bibliotheque, Musée Plantin, Antwerp, and a cleverly-drawn interior of the "Gatehouse, Kenilworth" (124), with its carved overmantel, in which there is no lack of sympathy and vigorous brushwork. The evening and sunset studies of Stuart Lloyd (101—114) are always pleasing; feeling work is also shown by H. C. Fox (93), tone and atmosphere in which are unsurpassed. "An Old Wife's Tale," by Henry Sykes, is one of the best things in the way of domestic *genre*, the grouping of figures and interior furniture reminding us of Teniers, in minute detail and solid painting. A. Ludovici's "Evening on the Arun" is pleasant. One of the cleverest things in the N.E. room is Nelson Dawson's deftly-painted sea piece "White Horses," the foamy surf and waves rendered with inimitable adroitness by a few touches. A. W. Strutt (208) has a well-

studied subject, "Hold Tight"—a waggon in a hollow with youngsters in it, drawn with masterly skill; and there is also a finely-drawn head of an old man by Walter Langley (210). Other drawings and sketches of merit must be left unnoticed in this large collection, including one or two notable drawings by F. P. Barrand, especially his capital view of Christchurch Cathedral, Oxford, and some works by Jas. Hayllar, and the secretary, Horace H. Canty.

THE SOCIETY OF ARCHITECTS.

THE second ordinary meeting of the Society for the present session was held on Tuesday evening, Mr. E. Clerk Allam, vice-president, in the chair. Messrs. Tom Cook, 39, Victoria Buildings, Manchester, and Ernest Wise, Launceston, were elected as members.

THE "PRESENT WORTH" OF ARCHITECTURE AS A SERIOUS LIFE'S PURSUIT.

Mr. G. F. Terry, member, read a paper on this subject. The author remarked: On looking into the question of architectural training, we are at once confronted with the great lack of unanimity which prevails as to the main lines to be laid down for an architect's education. What are the main requirements and conditions essential to success, or, at least, to the avoidance of failure, in our profession? Any reliable information upon this point must be of the greatest concern to any parent or guardian before committing a youth for life to an architectural career. Might not a student's textbook or manual be compiled, embracing the entire training of an architect, and giving in detail all the various branches of study, with the order in which they could best be taken up, according to circumstances, and containing any other necessary information bearing upon the subject? A project somewhat like this was put before the Royal Institute of British Architects by Mr. Phené Spiers as long ago as 1871, and two years since Mr. Millard brought the same subject before the Architectural Association: in both cases they seem but to have called forth a little discussion, and then to have fallen flat. Is it that vested interests in the "pupil farming" system are still all powerful? or is it left for the Society of Architects, with its newer life and vigour, to effect the required change? The old adage, "As the twig is bent," applies with equal force to, "As the pupil is, so is the architect." Time need not be wasted or your feelings be harrowed with that "apparition," the pupil out of his articles, wandering disconsolate in search of his first place as an assistant, who, after months, perhaps, of fruitless rambling, accepts a post as an improver. This points forcibly to the fact that something is wrong, which cannot fairly be put down to the inherent carelessness, ignorance, or laziness of the average boy fresh from school. It is questionable whether the ordinary architect's office is the best place for a pupil at first, or whether the practising architect, be he prosperous or struggling, is the man to undertake such a responsibility, although nothing can be better than, or equal to, holding a position in a good office for the finishing of an architect's training, outdoor study and travel being undertaken as well. We now pass on to what naturally is the most important part of this paper, taking it for granted that the pupil is fairly competent and has started practice for himself. What can he reasonably be led to expect as a return for his study, and what prospect has he of success? What is "the present worth" of his Art? To begin with, there is no profession requiring so much study so poorly paid; and this fact ought to be more widely known than it is. Let us now consider what hindrances we have to fight against in our daily professional life; whether these hindrances are of ourselves, and, if so, how far it is in our power to lessen or to remove them; or whether they arise from public want of confidence in us, or from want of sufficient capacity on the part of the public to appreciate us. And in answer to our first point—unless we have confidence in, and respect each other, we cannot expect the public to do so. Much has been done by all our societies in maintaining and enforcing professional honour, but unfortunately much yet remains to be done. Can we not all call to remembrance, at some time or other, instances where architects have supplanted one another, or where we have been almost compelled to accept unfair terms when offered by public bodies, because we knew that if we did not accept them other members of our profession would be quite willing to do so? Then the present system of competition is bad. It seems almost impossible to expect rivals to treat one another as brethren, and to refrain from all unworthy artifices, under this irrational and unjust method of seeking out rising talent. Then there is also a lack of perfect confidence in us amongst the public, arising partly from a misconception and ignorance of our art, and a kind of half-belief that we are apt to increase the cost of our buildings in order to enlarge our fees. The want of confidence in our skill rests with ourselves as individuals to remove, and it may be mentioned that there is this same feeling on the part of the public with regard to all other professions. As to the increasing of cost for our own advantage, our duty is simply to decline to carry out any buildings which are expected to be executed for an insufficient sum, and to support the societies and bodies which have done, and are still doing, such good work in setting up a standard of professional purity. Upon this point there can be no two questions, for when a number of honest men put their heads together, and show an honesty of purpose, the position and qualifications which they claim will sooner or later be admitted by the public. Before we accuse the public of being indifferent we shall do well if we look at home and see whether the work we turn out has any real claim to be interesting, and whether we have given them a fair chance of seeing what good work is. There is still a great necessity for us to improve ourselves. It has been said that "modern architects do not think—they only copy." How far is this true? Certainly we think as much as architects ever thought, and copy less; and yet honestly we must be very conscious that our art of to-day does not come up to what it was even two hundred years ago. Common sense and good art go hand in hand, so that if we only strictly adhered to what, after study, we believed to be good, true, and honest, instead of pandering to passing whims which the public soon grow tired of, we should be as sure of success, or at least as deserving of it, as the man who, by attempting to please everybody, by working in whatever style fashion may dictate, by submitting to what he knows within himself to be wrong, but which by chance may succeed in pleasing the public eye, can expect. A man who feels strongly, speaks plainly and clearly. A bad actor who has no real conception and feeling for his part, falls to ranting, that he may not appear deficient. Do we recognise this "ranting," or sensationalism, in architecture? It has been said that a modern villa has often as much ornament put into it as would have sufficed for a Mediæval castle, and a modern village church more than would be found in half a dozen old ones. It was not by this overcrowded ornament, this utter abandonment of all restraint, purity, and economy, that the beautiful effects of old works were achieved. If we try to analyse the design of an old village church, the first thing that will strike us is its meagre amount of ornament and the simplicity of its outline, and, though everyone will admire such work, there are few who would listen to us if we were to put such a design upon paper, and seriously propose to build it in bricks and mortar; they would tell us that there was nothing in it, and we should be implored to cut up the blank walls, to break the simple skyline, in fact to spoil all the repose, until every feature would seem meant to make the passer-by stare and wonder. You are all conversant with this type of building, of which unfortunately we have so much around us, full of chamfers and moulds, made on purpose to be stopped—every brick, in fact, made as conspicuous as possible, until the climax is reached in the roof with its varied-coloured slates and fussy ridge tiles. Such monstrosities as these only tend to degrade our art and ourselves. Many, no doubt, will remember the tax on windows, the ruinous effects of which are still traceable; but a tax upon ornament might do our architecture as much good as the former did evil: every designer would then be compelled to think of his planning and grouping, for some buildings erected nowadays, if deprived of their ornament, would have nothing wherewith to show that they were not designed by bricklayers and hodmen. It seems to be almost forgotten that beauty of form is as cheap as, or cheaper than, deformity. We should all recognise the great use which mechanical implements have been to us and the improvements to which they have led, so that nowadays to set a man to chip a block of marble into a column, or to shave a piece of wood into a baluster, when both might have been turned in a lathe in a twentieth part of the time, is simply a wanton waste of labour. Many architects purposely contrive those parts of a design in woodwork, which a modern workman would naturally wish to turn with a lathe or run with a plane, in such a manner that the man is compelled to work the whole by hand instead, simply because, for want of proper tools, work of this kind had to be done by hand in the Middle Ages. Machines which take off the workman's hands all the uniform and monotonous work—such as running moulds, &c.—and such as is required in large quantities with but little variety, are of the greatest value, and that to make a man execute such work by hand is to degrade him to the level of a machine. The craze for literal architectural correctness which we now hear so much of is another absurdity. We have been sickened with it in the Gothic Revival school, with all its love of imitating the barbarisms of Mediæval sculpture and painting. It requires very little knowledge of art, or rather power of thinking about art, to know that both Classic and Gothic imitations must be wrong. If old-world art was made noble, why cannot we, with our greater knowledge, our greater facilities and means, make it equally so? Is our art, the art of the giants of the past, to be so degraded in our hands and followed as a trade? Copying will not suffice for us. All must agree with Mr. Graham Jackson that the true hope of our art lies in the study of Classical forms on Gothic principles. This idea seems to be gaining ground daily, notably in the works of our leading architects. Let us now turn from the artistic to the more purely practical side of our profession. It is hardly necessary to point out to you the great difference there is between a London and a Provincial practice, and how much superior in position and regard the former is to the latter, although in large towns like Birmingham, Manchester, and a dozen or so others, architects enjoy much the same distinctions as London men. The country practitioner has many disadvantages—first, as a student, he has no societies whose meetings he can attend, no means of mutual help; then, as a professional man, his abilities are never adequately valued. Often he has to fight against strong local interests; his clients are exacting; he is expected to be nearly everything, from an architect to an engineer or commission agent; and he is generally found ready to undertake all kinds of work, from a church or town-hall to a sewerage scheme or sanitary inspectorship. Rivalry and jealousy are keen and rage strongly, and too often the most pushing and most ignorant men will elbow out the more retiring but better, upon most unprofessional terms, both morally and pecuniarily. Success cannot in the country always be attributed to superior merit, but rather to the circumstance that the most prosperous man is the one who has been able to secure the advantage of the largest local patronage. It is unnecessary to touch upon the expensive education, the vast amount of accurate and certain knowledge which every architect has to acquire as to the foundation-stones of his art, nor the time that must generally elapse before a living can be made in his profession, although these points are not sufficiently considered by the public, who seem to think that we are always ready for a scramble in a competition, even when the odds are ten to one against us. If our art is to be worth anything, architects must give up practising it like manufacturers, and restore it to the position which it held during the Renaissance period. Our art must be more to us than a means of self-interest, self-advancement, and all the other joys of five per cent. And now we come to the last point—"Does architecture suffer from the want of sufficient capacity on the part of the public to appreciate it?" That the public know little and care less for what constitutes architecture is one of the most discouraging facts which we have to battle with. If the public do not care for grace, dignity, or elegance in their buildings, our art must die, and die more completely than any other art, for architects cannot afford to build for their own delight. A poet or a painter can realise his dreams at his own cost and give them to the public as he creates them, but it is not possible for us to do so. Must we then stereotype the

taste of our employers, or starve, until the public can appreciate the importance, and master the essential principles of our art? Are we to conclude that modern civilisation and society, are, from their natures, incapable of the highest art? We see every effort now being made to encourage art, but unfortunately at present it is largely encouraged by fashion, and not from any inborn, true love of art for art's sake. Daily we are becoming more and more, for good or for evil, a land of great cities. Our population is crowding into towns and leaving the villages—crowding into ugly, foul, squalid, and ill-drained buildings. The question of the suitable housing of the poor ought to be more deeply studied by architects. It is quite in our realm. Our art can, if we use it aright, elevate and purify humanity, and the man who will deny this is not worthy of his calling. Lord Beaconsfield once said, "that the fate of a nation ultimately depended upon the health and strength of its population," and this wretched huddling together of human beings in ugliness and gloom will eventually lead to the demoralisation of our race, unless we architects do our best to awaken all we come in contact with to the belief that it is possible to make our art a fair substitute for destroyed natural beauty, and a silver lining to the dark clouds of smoke and the ugliness of our towns. The general aspect of our streets and buildings are embodiments of minds and natures warped more greatly than we can dare to contemplate, instead of being the living and glowing pages of a recorded art, handing down to our children the faith, the endurance, and all the aspirations which have laid the foundation of our greatness. To get at the genuine style of our period, we must not instance the works of men like Bodley, Norman Shaw, Jackson, Colcutt, and others: their buildings are mere "eccentricities" with which the public in general has no part or lot, but we must go to work which is done, as Mr. William Morris says, "without conscious effort," as exemplified in the jerry-built houses, and the long unlovely streets of uniform dulness and ugliness of our suburbs, in the stuccoed marine parades of our watering-places, and the flaunting "corner" public houses of every town in Great Britain. It is by doing this, and this only, that we are able to judge of the condition which our art is in. Does it not all seem a satire on our civilisation and on our culture? Where are the architectual influences that would tend to educate the people? Still, in conclusion, it should not be said of our art that all the good is over. We have the work of the past for instruction, and not for blind imitation. The powers of man are not diminished since the days of the artistic giants of old, and science has conferred upon us capacities of which they little dreamed. Architecture, therefore, pursuing her mission, and supported by art and by science, may, if true to herself, still look hopefully forward. When we consider the power of our art to endue buildings with grace, elegance, and beauty, or even appropriate gloom and horror; when we consider that our art is enshrined in durable and lasting materials, and that our buildings must reflect the character of our age to coming generations, we cannot for one moment doubt that Architecture *is* worth living for. Are there not still eloquent "sermons in stones" for us of the 19th century to preach, although it must be admitted that at the present time we are beset with so many depressing influences, that it is not surprising that some are tempted to despair, and to see if they cannot win in the race for fortune, when they have thrown away the desire for fame? Our courage and endurance must rise superior to this; our professional life must begin and end in our offices. No good piece of work is ever thrown away; but, be this as it may, this we can do—we can help to hand down the tradition of our art unimpaired to happier times and more sunshiny days. It may be that the age of lavish architectural display is past; but may we not yet find success in bringing our art to bear on the tastes and habits of millions, and by striving to give Englishmen healthier and happier homes. These are neither light nor unworthy objects. Our mission is not one of mere trifling or pleasure, but rather one of deep and earnest sympathy with the wants, as well as with the artistic feelings, of all classes of men. We are, or should be, brothers in the effort to make the happy happier, and the sad less miserable.

Mr. E. Tidman, in proposing a vote of thanks, said he differed from Mr. Terry's wholesale condemnation of modern jerry-built houses as he did not believe our houses even in the worst districts were so bad and so unhealthy as those erected for a similar class of tenants, say, a century since. If they fairly compared the character of the older houses in such a district, say, as Bethnal Green with those now put up by speculating builders, they would admit a real improvement.

Mr. W. R. Mallett, who seconded the vote of thanks, complained that Mr. Terry had entirely confined his attention to the artistic side of the subject, whereas the title had suggested that he would deal with the practical aspect of the question. The first object in adopting a profession was to make a living, and only secondarily might perhaps the question of giving aid or pleasure to others come in. There were undoubtedly too many men in the profession; but if all buildings were intrusted to architects, there would be plenty for all to do. Auctioneers, land and estate agents managed to pass the examinations of the Surveyors' Institution, and by adding "F.S.I." to their names, took work out of the hands of architects. He hoped that registration would remedy this.

Mr. G. H. Guillaume could not agree with the prosaic views expressed by the last speaker, although the paper would have been better had it been more practical. He did not hold with Mr. Terry's views that the architect should aim at utilising machine-turned balusters and mouldings as far as possible; his own endeavour was to avoid these, and there was nothing derogatory to the workman to execute such details by hand, while the effect of manual craft was infinitely superior to machine-made work. As Mr. Graham Jackson had well observed, the architect should strive to avoid the mechanical in his designs.

Mr. W. R. Wells could not agree with the author's startling preference for Metropolitan over provincial offices as training schools for pupils. If he had a son he wished to article to an architect he should unhesitatingly select a country office, as he would gain there an all-round training, which could not be acquired in London.

Mr. F. W. Fryer having spoken, the Chairman, in putting the vote of thanks, expressed his regret that the lecturer had raised questions which he had failed to answer, although succeeding speakers had, to a large extent, replied for him. If youths before being articled to the profession had one or two years' training in practical work, they would derive far more benefit from their term of pupilage, and there would be fewer instances of young men who abandoned the profession after expending three years and paying a premium for learning it. As to whether architecture was improving or not, he should answer in the affirmative. If the profession was overcrowded, the same was complained of every other profession, and as the public taste improved—and no one could doubt that it was improving—the position of architects would benefit in like proportion. For jerry-built houses architects were not responsible, and for the artistic and constructional failures in buildings of a better class, too often the client's views and economy were more largely responsible than the architect.

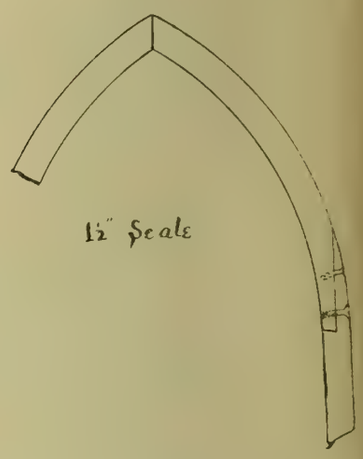
Mr. Terry, in reply, said that in country offices pupils often found that land and estate agencies, and other things were combined with the study of architecture, and that there was still in the provinces some truth of Dickens's sketch of Mr. Pecksniff's office. He had not replied to the questions he raised, but mooted them to be answered in the life and practice of those who heard him.

CARPENTRY AND JOINERY.—XXV.

WINDOW FRAMES AND SASHES (*continued*).

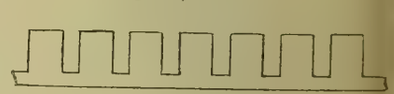
IT will be evident that other descriptions of curve-headed frames can be treated on similar principles to those laid down for the segment and semicircle. For instance, the Gothic, as shown in Fig. 171, is fitted to the stile of the frame and screwed through from the back; at the crown joint the connection can be made either by screws or nails, screws being best. This style of head can be either got out of the solid, each half in one piece, or it may be *built*, that is, got out, transversely in section, in three pieces screwed together, and then the joints made. The pattern which has been got out will serve to work the joints to, nearly; but they must be accurately fitted to the check made in the stiles. The crown joint should be made with the pieces laid in position on the drawing board, first being roughly jointed by the pattern. The same rule applies as was given for jointing door-frame heads curved in elevation. It will be obvious to the workman that the pulleys in this and the two former kinds of frames can only be put up near the springing of the curve, and this is done

Fig 171



just as near as can be, so as to leave sufficient strength for holding the screws, and so as that the piece will not break or chip away between the pulley and the springing during the working. In the case of frames having only the outer portion, that is from the *parting bead* outwards, wrought to the curve, the inner pulleys can be put up to the usual place. A plan which is somewhat rarely adopted for curved surfaces, as in sash-frame heads (when curved) and in other situations where only one side (the concave) is of importance, is shown in Fig. 172; and which is—take a piece of the length, breadth, and thickness required, and run a gauge-line on both edges for the thickness of the veneer to be left in front; then groove out portions across the grain (back side), so as to admit of the piece being readily bent upon a centre. The grooving or trenching may be done either by hand or with the aid of machinery, whichever is available. Whenever it has been bent upon a centre, pieces are fitted into the grooves, so as to keep it curved; of course, these pieces must be well fitted and glued in, and should be thoroughly dry, and outside of all a piece of rough, stout canvas glued on. The

Fig 172



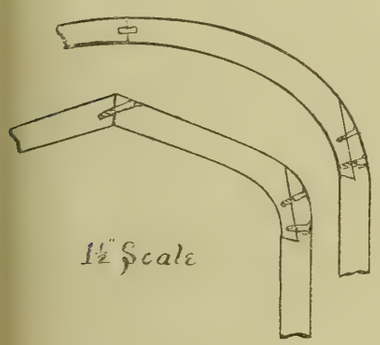
piece selected for such a purpose as this should be very flexible, and clear of knots or other imperfections. The joint forming the connection between head and stile should be well glued when it is put together finally; but, as all workmen know, all fitting and preparing should be done and everything in the greatest readiness beforehand, so that no hitch may occur in the final process of gluing-up. Other joints of the head may be glued also, as glue has the effect of making a joint airtight, and prevents the action which otherwise the atmosphere would have upon it.

The elliptic head, as seen in Fig. 173, would be connected similarly, so also the Tudor or any other peculiarly shaped head. The workman must just use his judgment as to the best and readiest method in every case of getting out heads of the several kinds named; but the usual methods have been explained. Kerfing is some

times brought into service for the work under treatment; but few, if any, architects would allow of it. It has been and is adopted when the risk of its discovery is small, because of the inexperience of the owner upon whom it is being palmed off, as, when it is painted, except the lines where the saw has entered, all is hid by the casings. The workman will also be careful in the matter of casings, and see that all joints fit properly, and see also that the frame is kept at the right width across the springing until the casings have been thoroughly fastened; and even when the frame is fixed or in process of being fixed, it is well to test this.

A few general remarks upon frames which are *circular on plan*. Fig. 174 gives an illustration of such, and a fuller-sized section through the stile and casings is also given. It will be noted first of all, instead of the stiles of such a frame converging to the centre, they are parallel to each other, and to a centre line; it used to be otherwise, but by sad experience our forefathers were taught that the sashes had to be put in from the outside, as also some other inconveniences. Some points were much easier got over because of the converging stiles; but the drawbacks overcame the ease, and the present method obtains. The workman will have comparatively little difficulty after having laid down his ground plan and got out templates of the stiles and casings, &c. He will note that the edges of the stile are parallel to each other, though bevelled, and that the ploughing or grooving is also *on the angle*; but he will get accustomed to *working on the skew*. When the head is level no difficulty worth mentioning arises, as it (the head) can be laid on the

Fig 173



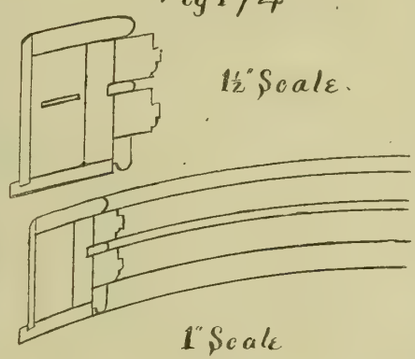
board and the lines transferred for sinking for the stiles. Note the exact width of head and sill as compared with the breadth of the stiles. Be careful, in grooving the stiles, to do so at the proper angle, the head being grooved square *in elevation*. It is just as well to mark the ends of the stile with the *section mould*, gauge the face of the stiles. Should the window which is *circular on plan* have a segment head, then the simplest way is to take it *out of the solid*, have a block of wood sufficiently large each way, cut it out to the curves of the elevation first (supposing it to be done with a band-saw), *tack on* the pieces temporarily which are to be cast away, put on the lines for the curve on plan, or they may have been put on when the lines for the curve *in elevation* are put on; cut it out to the plan lines, then the pieces which are waste will be found very useful by the workman to form a bed for working his head and casings in. The same rule applies to the cutting out of the casings. The head can be laid on the drawing-board, and a *set-square* run round the plan lines laid down thereon in order to test it, and so when the head in elevation is a semicircle, a set-square or plumb-rule may be used to test the truth of the head to the plan lines; the drawing-board would of necessity require to be level. If this method is not adopted, the workman must resort to the *development of the surface system* by getting the curved line along the stretch-out of the curved soffit (inside) of the head of the frame on the similar principle to that of the falling-mould used for stair-rails.

This is a matter of geometry, without which the advanced workman cannot get on well. Having hinted at the necessity for acquaintance with theory in the higher branches of the trade, it is hoped the workman will apply himself to the mastery of practical geometry, or those problems at least which are constantly recurring in his practice. The rudiments of the trade are usually learnt by actual practice; but, thanks to the increasing introduction of technical schools, theory is being combined with the practice, and so both brain and hand are being trained together.

To return to sashes, and as a margined semi-circular-headed sash has been dealt with, a Gothic one of similar type may be treated of.

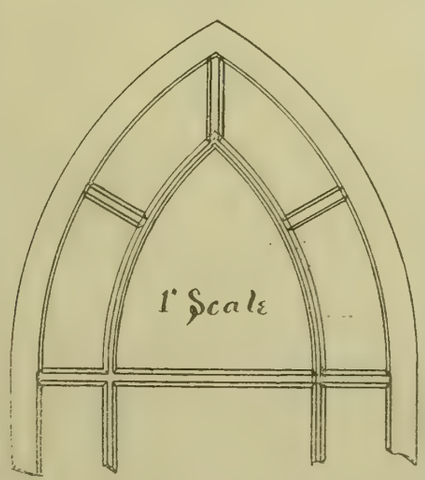
Fig. 175 shows such; templates for head and

Fig 174



bars having been got out (the template being got out for one side is reversible), the stiles will have part of the curve on, and the joint between this and the remaining part of the curve to continue to the crown may be made with a double-ended key, and the joint at the crown will be made with a double-ended key of a somewhat reversed V-shape to suit the apex of the sash. If economy is considered, it is either screwed or nailed, and even at the springing sometimes it is only screwed, and the connection is similar to that of the stile and head of frame which is shown in Fig. 171, and elsewhere (halving and screwing). The bars are cut out of the solid and worked curved, and as such moulded and rebated. In laying down the working lines of the elevation of the sash-head it will be noted that for the cross bars dividing the panes in the curved portion a line is drawn from the centre from which the curve has been described, and a distance equal to half the thickness of the bar set off on each side; otherwise this piece would taper slightly, which is not done in practice. These short dividing bars are tenoned into the curved bars and head, and the dividing bar at the crown is *stumped in*; any other item which may occur has been treated of in the semicircular

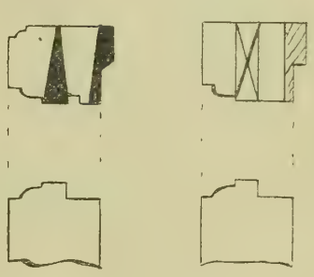
Fig 175



case. Note the scribing of the short upright bar at the crown, as it is peculiar and requires a little care. The main points in regard to sashes have been mentioned; two others had best be noticed—they are in regard to the meeting-rail; first, in in some workshops no *joggle* is allowed beyond the meeting-rail, the sash stiles being in the same straight line as the meeting-rail.

Fig. 176 shows the point alluded to, the inked *dovetail* showing the end of the meeting-rail, which continues through the stile. A little pattern of the dovetail is got out and used in working both the end of the meeting-rail, and also in making the necessary provision in the stile. Be sure that all is tight fitting, and not too tight, as that would split the end of the stile, or it may be the meeting-rail. In wedging up the sash when ready, a pin or dowel is put through the stile or meeting-rail, being previously glued. The other plan adopted when no joggle is allowable is to mortise for the meeting-rail, full size (tight) in the ordinary way; that is, the meeting-rail is mortised, for no *haunching* is allowed. As stated, the mortise is the full size of the thickness of the meeting-rail, as seen in Fig. 177, where diagonal lines are drawn across the tenon. When the sash is being wedged up, this tenon is pinned or dowelled similar to the last method, and the portion of the stile left on so as to allow of mortising safely is cut off. It is to be understood that no wedge room is allowed for in this latter method, the glued dowel being the only means used for keeping the sash together at this place. By adopting either of these two methods there is no hindrance to planing straight along the meeting-rail when the *horns* have been cut off. And now a few remarks on wedging up sashes, so as to conclude this kind of sash frame and sash. Prepare the bench by clearing away all the tools from underneath where the sashes will be wedged. Put the cramps in position, whether they are wood or iron, and their position

Fig 176 Fig 177



is clear of, and within the tenons of, meeting-rail and sill, or meeting rail and head, so as to allow room for the stroke of the hammer. Have a squaring lath ready (this has been described previously), and the glue in good order, wedges and dowels also ready; ⅝in. or ¾in. dowels are ample in nearly every case, and should be of dry timber, split and driven through a *dowel-plate*. The wedges should be dry also, and if there is a stove or drying-room, they should be spread loosely on a board and placed in it. Having, then, all these necessary preparations made, and as wedging up sashes is a two-handed job, it is expected both workmen are ready. The stiles are driven off, or nearly so, and the tenons, and especially the shoulders, well glued with the aid of a brush (a flat-shaped varnish brush is the best). The sash stiles are now driven close, and the cramps tightened upon them, and the squaring lath tried in so as to test whether the sash is really square or not; if not, either drive the stile which requires to be driven, or alter the cramps a little so as to take it in the direction required. By all this is meant, *if one corner is long* the stile of this is driven so as to shorten it, and the same result is procured by shifting the cramps in the necessary direction.

The stiles should be looked at so as to see that they are straight, and if the cramps have bent them put in a piece of the required length between the rebates of the stiles (the length of the piece is obtained from the sill or head). If the stiles are long, this should be done in every case, as when the sashes are wedged and pinned the stiles will remain in the position they have been wedged to. Having glued and driven in the wedges, the pins or dowels are bored for, glued, and driven in; sponge off with warm water the surplus glue; next cut off the wedges

and overplus of the dowels. No water should be allowed to remain, but ought to be wiped off, say, with some soft shavings, or with the sponge when the water has been squeezed out of it. The cramps are now slackened and the sash set aside for the glue to harden. Be sure to put it so that it will not warp, and it is expected that the cramps have been laid so as to be out of twist with each other. Segment, semicircular, Gothic, and Tudor-headed sashes are squared to the *springing*. In some workshops glue and white lead, and in others white lead alone, is used in wedging-up and pinning sashes. The writer prefers glue when the timber is dry, and this has been provided for in all the arrangements set forth under this heading.

Sashes are grooved for the cords or other appliances by which the weights are suspended after they are wedged up and *cleaned off*, when the shop is a machine one. But when the work is done by hand the sash stiles are ploughed before the sashes are put together. It is to be noticed the way in which they are ploughed—viz., towards the upper portion of each sash as it would be when in position, and from 12in. to 16in. Sometimes a hole is bored in each sash stile for the knot put on the end of the sash-cord, in which case the ploughing is not carried so far, and a long screw bit is used to form the connection between the plough groove and the hole for the knot. The hanging of the sashes will be more fully explained when the fixing of the frames is treated of.

APPLIED MECHANICS FOR ARCHITECTURAL STUDENTS.—III.

GRAPHIC DELINEATION OF STRAINS.

15. IN the examples previously given of the application of the "parallelogram of forces," the amount of the strain in the various parts of a frame are indicated by straight lines. The "Graphic" method, which is now commonly used for determining the strains in framing, is a development of this principle, a complete diagram being drawn, each line of which indicates the strain in the part of the truss or frame to which it is parallel. The basis of this method may be described as follows:—Suppose the three forces, P, Q, and R (Fig. 11), acting at A, B, and C,

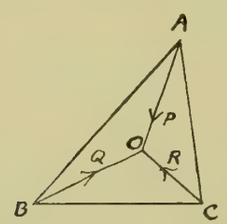


Fig. 11.

to keep the triangular frame A B C in equilibrium, and to meet in the point O. If we draw another triangle, K L M (Fig. 12), whose sides are respectively parallel to the directions of the forces P, Q, and R, the sides K M, K L, L M will be proportional to those forces. Draw the lines K X, L X, M X parallel to the sides of the frame, and they will represent the stress produced in those sides respectively by the forces P, Q, and R. Fig. 11 is called the *frame diagram*, and Fig. 12 the *stress diagram*. The lines forming the triangle in Fig. 11 are represented in Fig. 12 by lines which meet in a point, and the lines forming the triangle in Fig. 12 are represented in Fig. 11 by lines meeting in a point; or the figures are *reciprocal*.

16. We will apply this principle to the delineation of a "stress diagram" for the king-truss, Fig. 5, described in our last article (9). Here we will suppose that W is the load sustained on *each* side of the truss, including pressure from wind, &c., and that one-fourth of W is supported directly at B and C, one-half W at A, E, and F, Fig. 5. Let w be the weight of the tie-beam and the ceiling attached to it, one-half of w being sustained by the king-post at D. Draw a vertical line $a f$, Fig. 13, and take $a b$ to represent on scale one-fourth of W, $b c$ to represent one-half of W, $c d$ one-half of W, $d e$ one-half of W, and $e f$ one-fourth of W. Draw the lines $b l$ and $c k$ parallel to A B, $e m$ and $d i$ parallel to A C in Fig. 5. Take $a g$ and $f h$ each to represent W + $\frac{1}{2}w$, and draw the horizontal lines $g l$ and $h m$, intersecting $b l$ and $e m$ in l and m. Draw $l k$ parallel to D E, Fig. 5, and $m i$ parallel to D F, and join $k i$. Then the line $b l$ will be the compressive strain down the rafter E B, $c k$ that down A E, $e m$ and $d i$ the same for A F C.

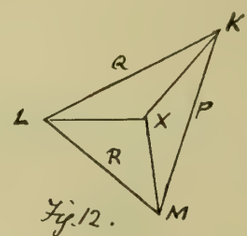


Fig. 12.

The lines $k l$ and $i m$ will represent the compressive strains in the struts D E and D F, $g l$ will represent the tensile strain in the tie-beam B D, and $h m$ that in C D. The tension in the king-post is represented by the vertical line $k i$. The strong lines in the figure represent compressive strains, and the dotted lines tensile strains.

The stress diagram for the queen-post roof, Fig. 6, can be delineated in exactly the same manner, one-half of W being sustained at A and at D, one-third of W at K and at L, and one-sixth of W at B and at C. Each queen-post will

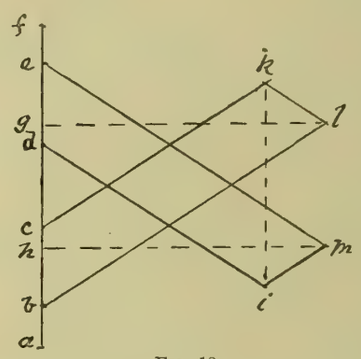


Fig. 13.

also sustain one-third of the load on the tie-beams.

17. A common form of iron roof is that shown by Fig. 14, which is supposed to sustain the load of the roof-covering by purlins at A, B, C, D, and H. If W is the load on *each* side, then we have half W at A, half W at D and at H, and one-fourth W at B and at C. To form the "stress diagram," draw the vertical line $a f$ (Fig. 15), and take $a b$ to represent one-fourth of W on any scale, $b e$ to represent half W, $c d$ one-half W, $d e$ one-half W, and $e f$ one-fourth of W. Draw $b i$

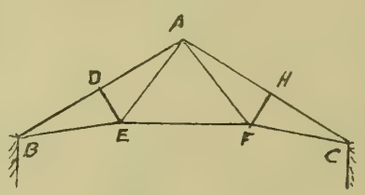


Fig. 14

and $c l$ parallel to the rafter A B, $e k$ and $d m$ parallel to the rafter A C. Draw from the middle point h of the line $a f$ the line $h i$ parallel to the tie-rod B E, and $h k$ parallel to C F. Draw $l i$ parallel to D E, and $k m$ parallel to H F. Draw $h o$ horizontal or parallel to E F, $l o$ parallel to A E, and $m o$ parallel to A F. Then $b i$ and $c l$ represent the compressions down the rafter D B and A D, $e k$ and $d m$ the same for A H C; $l i$ represents the compression down the strut D E, and $k m$ that down H F. The lines $h i$ and $h k$ represent the tensile strain in B E and C F, $h o$ that in E F, $l o$ and $m o$ that in A E and A F. The strong lines in the *stress diagram* indicate compressions, and the dotted lines extensions.

If the ties B E, E F, F C are all in one horizontal line, so as to form a continuous tie-rod, the lines $h i$ and $h k$ (Fig. 15) will be in the same

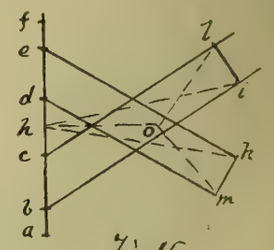


Fig. 15.

line with $h o$, or the points i and k will merge into one point on the horizontal line drawn from h, which line will represent the tensile strain in the tie-rod.

18. The following is an example of a common form of iron roof in which the tie-rod is horizontal throughout, and the tension the same in every part of it. A B and A C are the rafters and B C the tie-rod (Fig. 16), between which is

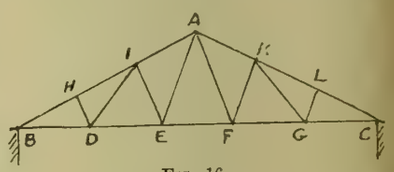


Fig. 16.

a series of cross bracing, the parts of which are partly in compression and partly in tension. We will suppose that W is the load on each side, and borne by purlins at A, I, H, B, K, L, and C, one-third of W being supported at each of these points except B and C, where the load is one-sixth W. We will also suppose one-fifth of the weight of the tie-rod to be sustained at each point D, E, F, and G, although this weight is of minor importance, and may be neglected unless the tie-rod has to carry a transverse load, which is not usually the case in roofs of this kind. To construct the stress diagram, draw the vertical line $a h$ (Fig. 17), and take $a b$ to represent on any

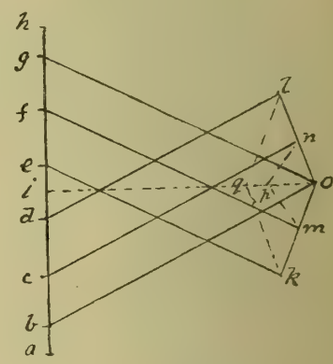


Fig. 17.

scale one-sixth of W; $b c$, $c d$, $d e$, $e f$, $f g$ to each represent one-third of W; $g h$ one-sixth of W. Bisect $d e$ in i, and draw the horizontal line $i o$, meeting $b o$ and $g o$ parallels to A B and A C in the point o. Draw $c n$ and $d l$ parallel to $b o$, $f m$ and $e k$ parallel to $g o$. Draw $o n$ parallel to H D, $n l$ parallel to E I, $o m$ parallel to G L, $m k$ parallel to F K. Draw $p n$ and $p m$ parallel to D I and G K, $q l$ and $q k$ parallel to A E and A F. Then the line $b o$ represents on the above scale the compression down H B, $c n$ that down H I, and $d l$ that down A I. The horizontal line $i o$ represents the tension in the tie-rod B C; $p n$ is the tension in the brace D I, and $q l$ that in the brace A E. The line $o n$ represents the compression in the strut H D, and $n l$ is the compression in the strut I E. The weight of the tie-beam, or any load it may have to carry, is not reckoned in the foregoing diagram; but if it is of sufficient importance to cause a material strain on the braces, we must alter the diagram to include it. If we suppose

w to represent the load on the tie-beam, then we must increase $c\,d$ and $f\,e$ (Fig. 17) by one-fifth of w, and $d\,e$ by two-fifths of w. We can then proceed with the rest of the figure as before, but some of the lines will be altered in length. The strong lines in the *stress diagram* show the parts in compression, and the dotted lines those in tension.

19. We will now apply the "graphic" method to find the strains in the parts of a braced iron girder as shown by Fig. 18, which is known as a

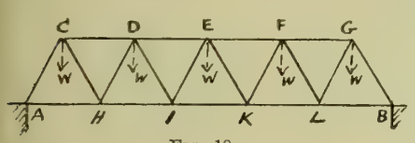


Fig. 18.

"Warren" girder. This girder rests on supports at A and B, the ends of the lower flange, and is loaded with an equal weight W at each of the points C, D, E, F, and G of the upper flange. To draw the *stress diagram* take the vertical line $a\,f$, and let $a\,b$, $b\,c$, $c\,d$, $d\,e$, and $e\,f$, each represent on scale the weight W. Bisect $c\,d$ in h, and draw a horizontal line $h\,o$; also draw horizontal lines through b, c, d, and e. Draw $a\,k$ parallel to A C (Fig. 18), and $f\,k$ parallel to B G; $k\,q$ parallel to C H, and $k\,p$ parallel to G L. Draw $q\,l$ parallel to H D, $p\,l$ parallel to F L; $l\,n$ parallel to I D, $l\,m$ parallel to F K; $o\,n$ parallel to E I, and $o\,m$ parallel to E K. Then the stress diagram is completed, $a\,k$ representing the stress in A C, $f\,k$ that in B G; $k\,q$ the stress in C H, and $k\,p$ that in G L; $l\,q$ the stress in H D, and $l\,p$ that in F L; $l\,n$ the stress in D I, and $l\,m$ that in F K; $o\,n$ the stress in E I, and $o\,m$ that in E K. The horizontal line $b\,q$ represents the

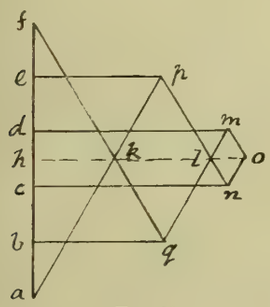


Fig. 19.

strain in C D, and $e\,p$ that in G F; the line $c\,n$ is the strain in D E, and $d\,m$ that in F E. The strains in the lower flange are represented by the line $h\,o$; $h\,k$ being that in the parts A H and B L, $k\,l$ that in H I and K L, and $l\,o$ the strain the middle part I K.

By applying the principle of the "triangle of forces" (4) to the different triangles forming the stress diagram in any of the foregoing examples, we can ascertain both the directions of the strains and also distinguish between the compressive and the tensile strains, by the direction of arrows following each other round the triangles; the loads in the vertical line acting downwards giving the direction to start with.

20. The same diagram of stress (Fig. 19) can be used to find the strains in the parts of a "lattice" girder (Fig. 20), which may be con-

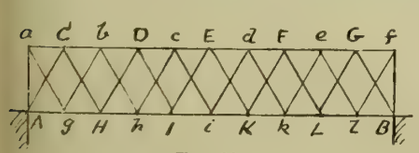


Fig. 20.

sidered as formed of two "Warren" girders placed reverse ways; the capital letters indicating the "Warren" girder, as in Fig. 18, and the small letters the reversed "Warren" girder. In this case we suppose each separate half of the lattice girder to support half the load, divided equally, as in Fig. 18, at the apex of each triangle, as C, D, E, F, and G in one half, and g, h, i, k, and l in the other half. Let Fig. 19 represent the *stress diagram* of one half, and an exactly similar diagram on the left-hand side of the vertical line $a\,f$ will represent the *stress diagram* of the other half; then the strains in the various parts will be the sum of the strains in the two figures, or the resultant stress on each part of the "lattice" girder will be represented by the sum of the stresses produced by the loads on the separate "Warren" girders composing it. Thus, the strain in I H (Fig. 20) is represented by $e\,p + h\,k$ (Fig. 19), that in I K by $c\,n + l\,o$, the strain in E F by $d\,m + l\,o$, while the strain in A C is represented by $a\,k$, and that in $a\,g$ by $f\,k$, and so on throughout the frame.

DOMESTIC WATER SUPPLY.

THE rules and regulations of the Edinburgh and District Water Trust, proposed to be put into force throughout the district, adopt a few very useful principles, which might be kept in view in the water supply of our town houses. Either iron or lead pipes may be used; if the latter, they must be made of strong galvanised iron steam tubing, capable of standing a pressure of 360lb. to the square inch, and where the internal diameter exceeds 1¼in., the trustees may require the same to be of cast iron of certain weight and dimensions, as may be prescribed. Lead pipes are to be of certain weights, those supplied from the street main being heavier than those supplied from a house cistern. Thus, a ½in. pipe (internal diameter), if supplied from main, is to be 7lb. per lineal yard, if from cistern 6lb.; a ¾in. pipe to be 10lb. if from main, and if from cistern 9lb.; an inch pipe to be 16lb. from main, and 12lb. if from cistern; a 1¼in. pipe to be 22½lb. from main, and 16lb. from cistern. Another important rule is that no pipe shall be laid in the course of any gaspipe, or fixed through into any cesspool, drain, or other place where the water conveyed through such pipe may be liable to be fouled or wasted, except in those cases where the course of both are unavoidable, and then the water-pipe must be passed through an exterior cast-iron pipe of sufficient length and strength to afford due protection to the water-pipe. Service-pipes are to be laid at least 2ft. 6in. below surface of ground, and in exposed places must be protected from frost. The trustees have power to limit each house to one service-pipe, except tenements of three flats besides the ground floor, where two rising pipes of ¾in. diameter are allowed, each separately connected with the main, one for the lower half and the other for the upper half. Shops have also a separate pipe. Upon each pipe a watertight stopcock must be placed in the roadway 2ft. beyond the water channel, protected by a cast-iron box having a movable lid fastened by a chain. It is also recommended that another stopcock—a screw-down or ground-cock—be put on the service-pipe inside the premises close to the outside wall in a position easy of access, so that the water can be turned off in case of frost or accident. We commend this rule to every householder and architect's attention. The officer of the Trust is to approve of all plumber work before the pipes are supplied with water, a necessary precaution to insure proper water fittings. The Trust have also to insure a proper connection of service-pipe and main, supply the tubes for connecting, and bore the main, and also insert the service-pipe, for which a charge of 5s. is made. Alterations and extensions of pipes or fittings can be made only after notice of 48 hours to the superintendent, who has power to approve of the same. No service-pipe is allowed to be connected directly to any steam, hot-water boiler, urinal, or closet, &c., but only convey water to an accessible cistern, drawing-off cock, meter, or other apparatus prescribed. "Sweated" joints are not allowed.

The regulations relating to cisterns are noteworthy. The water in the mains is laid constantly on under pressure; but in premises at a greater height than 50ft. above the street level or that are more than 200ft. above Ordnance datum, cisterns are to be provided of capacity sufficient to give a day's supply not to contain less than 75 gallons for each house. If hot-water pressure boilers, baths, &c., are used, 100 gallons must be provided. Cisterns are to be placed not less than 15in. from the ceiling, and have an access hinged door 18in. by 30in.; no cistern containing water for drinking or cooking to be placed in or under a w.c. Other points relate to the ballcock, and its position and fixing. Baths must have inlets distinct from the outlet; water-closets are required to have a full and complete self-closing apparatus; this is not to be supplied direct from the main, but through a proper cistern not to contain less than 30 gallons, to be fitted either separately or in combination with a waste-preventing apparatus, so constructed as to discharge not more than three gallons of water at each flush. The other rules refer to the fittings, draw-off taps, stopcocks, ballcocks, and the penalties imposed for infringing the rules. The proposed rules are reasonable, and will protect both the Water Trust and the consumer. In the Metropolis, if a general code of regulations were in force instead of the present irregular system that prevails, we should see service-pipes of proper diameter and uniform weight, laid so as to avoid passing water closets and foul cellars and near gas-pipes; we should find every house-cistern placed in a closet or otherwise inclosed in wood or felt under or within the roof, and having easy means of access provided.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

AT a special general meeting of the donors and subscribers held at the offices, 21, New Bridge-street, E.C., on Tuesday, the 26th inst., Mrs. Fisher, the widow of a builder's clerk, was elected to the pension of £20 per annum by show of hands, she being the only candidate. This makes nineteen pensioners now on the books. The proceedings were very brief, and at the close a vote of thanks was presented to Mr. E. Graystone (of the firm of Messrs. Hall, Beddall, and Co.), who kindly occupied the chair in the unavoidable absence of Mr. John Aird, M.P., the esteemed President of the Institution.

CHIPS.

A scheme for deepening the Severn as far as Worcester to make it navigable for ships of 600 tons register was discussed by the Cardiff Corporation on Friday. It was decided to subscribe £500 towards the initial expenses of the Bill, and also to invest £5,000 in the scheme. In all probability the improved waterway will ultimately be carried through to Birmingham.

The annual conversazione and presentation of prizes to the successful students in connection with the Gateshead School of Art took place on Wednesday week in the Town Hall, Gateshead. The Head Master (Mr. William Fitzjames White) reported that the past year had been one of great progress in the life of the school. Not only had the number of students increased beyond expectation, but they had earned an increased amount in Government grants. The various classes had been attended by 183 students, as against 130 in the previous year; 538 works, executed by 126 students, were sent to South Kensington in April last, of which a set of designs, &c., by R. W. Liddell obtained the highest marks given at that examination. In the time examinations held in May forty-eight students obtained sixty-five successes. Twenty-three works were accepted for art class teachers' and art masters' certificates.

The new lighthouse at Point of Ayre, at the extreme north of the Isle of Man, will be placed about 250 yards from the present lighthouse and nearer the shore. The light will be lower than the existing revolving light. Messrs. Stratton, of Edinburgh, are the contractors. The work of construction has been commenced.

The movement for reconstructing the Church of St. Cuthbert in Prince's-street, Edinburgh, has met with a check, for, owing to a rise in prices, the contractor, who was willing to undertake the work at £14,000 when the plans were passed by the kirk session a few months since, now requires an additional £3,000. Public opinion also is less disposed to sanction the project than when it was originally brought forward, a change to which the letter which appeared in our Correspondence Columns on the 11th August, and since reprinted as a circular, has possibly contributed.

A new public hall and reading-room are approaching completion at Tarvin, Cheshire. The style is half-timbered, and the materials used are red brick and terracotta dressings, supplied by Johnson and Son, Tarvin. The main hall is 50ft. by 20ft. inside, and is lighted by seven windows and two sunlights. At the south of the building is a gallery which seats 120 persons, and the hall and gallery will accommodate 600 people. Messrs. George Wright and Sons, of Kelsall, are the builders.

The name of Kenelin Chandler, late of Hertford-road, Lower Edmonton, present residence unknown, surveyor, appears in Friday's list of receiving orders under the Bankruptcy Act.

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OUR LITHOGRAPHIC ILLUSTRATIONS.

COLOGNE CATHEDRAL.

THE large photograph which we reproduce to-day of this famous church is by Herr Anselm Schmitz, of Cologne, and was awarded the medal of the Photographic Society of Great Britain a few weeks ago. The smaller photograph, by the same hand, gives a detail of the finial of the southern spire, which is the loftiest in the world, and therefore, this picture, taken from off the scaffold erected for the recent completion of the towers when the late emperor laid the last stone (Oct. 15, 1880), shows the highest example of architectural stone-carving that man's ingenious patience has succeeded in erecting anywhere. The Eiffel Tower is about 984ft. high, and although thus by far the loftiest building on the earth, cannot be compared with the spires of Cologne. Their height is 532ft., and the nearest approach to their elevation is the iron central spire of Rouen Cathedral, which measures 482ft. high. Rheims Cathedral central spire is 422ft., and the steeple at Vienna is 441ft. high, while S.W. spire at Hamburg figures 472ft. from the ground. Strasburg nearly reaches this, being 468ft. tall. St. Peter's at Rome measures 460ft. to the top of the dome, and St. Paul's is supposed to be 356ft. to the ball which surmounts the cathedral. Salisbury Cathedral spire, the tallest in England, is 404ft. high, and St. Michael's spire, Coventry, which comes next, measures 320ft. These comparative particulars enable one to realise the vast proportions of the subject of our illustrations to-day, and besides, they give increased interest to the detail photograph, seeing that it was taken at such an immense height from the ground, and from a position never likely again to be possible, in so far as Cologne, at any rate, is concerned. King Frederick William III. rescued this cathedral from the state of a ruined fragment. During his reign, £50,000 were laid out upon it, chiefly in repairs. His successor, Fredk. William IV., contributed over £100,000 towards the £225,000 spent in his time. The late architect, Zwirner, estimated the total cost at £750,000. The north porch cost £100,000, and, like the more simple south portal, was designed by Zwirner. The iron flèche and iron roof of the nave were added in 1860-62, and the whole, except the towers, was nearly finished in 1865. The story about finding the original designs of the old architect for this church is thus told: The main façade drawings originally kept in the archives of the Cathedral were lost when, in 1794, the French occupied the city. One of the drawings representing the north tower was discovered in 1814 in a loft at Darmstadt, after it had been used by some one as the bottom of a tray, for being of parchment, the plan served well enough to dry beans upon. Fortunately, beyond the tack holes, the drawing was not seriously hurt, and Dr. Möller, a distinguished antiquarian of the place, published a copy of the sheet in 1818, when, after some inquiry, it was found to belong to a very large drawing of Cologne Cathedral on parchment, then in the possession of M. Imbart, an architect in Paris, who had bought it from M. Foureroy, he having found it in Belgium. M. Boisserée ultimately secured the parts, and sold the complete documents to the King of Prussia, and it is now in the safe keeping of the City of Cologne. The drawing measures 13ft. long by 6ft. 6in. wide. Cologne Cathedral was commenced in 1249, but the wars in which its archbishops were engaged absorbed all available funds, so that the choir was not finished till 1322. The nave and southern tower rose even more slowly. In 1437 the tower was built to the third stage, and bells were erected in it. In the 16th century the nave was built up to the level of the caps of the arcade, and the northern tower was made to match the other, and so the work tardily went on, while its gigantic scale may well account for this want of progress. Thus the length of the church is over 500ft., and its width, with aisles, is 280ft. The length of the transepts is 290ft. The roofs are more than 200ft. high, and the tower bases are 100ft. wide. The foundations of the southern tower are known to be at least 44ft. below the surface. The choir is 161ft. high. The aisles are double. The faulty stone from the Drachenfels on the exterior has been replaced by a sounder stone from Andernach and Trèves. We shall give some details of the masonry to the spires and portals shortly.

ABBEY BUILDINGS, WESTMINSTER.

THIS block of offices in Prince's-street, Westminster, has been erected in two portions, that shown in the view being just completed, and the remainder of the return frontage having been built about three years ago. The builder of the older portion was Mr. Thos. Boyce. The front of this is of picked stocks, with red brick dressings. The part just completed was built by Messrs. Harris and Wardrop. The facings of this are of Lawrence's best red bricks, rubbed and gauged throughout; and the whole of the ground floor and all the cornices and dressings are of Chilmark stone. The staircases are of oak and teak. The carving has been well executed by Mr. Mabey. The frontage to the return street is about 135ft. Mr. W. Gillbee Scott, A.R.I.B.A., of 25, Bedford-row, W.C., is the architect of the whole of the buildings.

A SHEET OF FOUR RESIDENCES.

AMONGST our illustrations will be found a sheet of four houses designed by Mr. Fred. Chancellor, F.R.I.B.A., architect, of London and Chelmsford. Potsgrove Rectory, Beds, is now in course of erection for his grace the Duke of Bedford, K.G. The external walls, which are 16in., hollow, are faced with red, hand-made, sand-faced, kiln bricks, with arches of rubbed and gauged bricks from Lawrence, of Bracknell; and the roofs are to be covered with Broseley tiles. The internal woodwork is to be stained and varnished; the principal rooms and staircase coated with Mander's best copal flatting varnish. The staircase, which is to be in pitch-pine, is to have square worked balusters and newels. The contract price, including stabling and other matters, is £2,000, and the builders are Messrs. Webster and Cannon, of Aylesbury. Gilston Rectory, Herts, also in course of erection, is being built of similar materials and treated in the same way. The amount of contract is £2,295, also including stabling, &c.; the builder is Mr. Alfred Brown, of Braintree, Essex. The other two residences are designed for the Upminster Hall Estate. Upminster is a village three miles from Romford. During the last few years a station has been opened at Upminster itself, the site for which was purchased from the owner of the estate. This station is on the new line from Fenchurch-street to Southend, and the estate is happily situated within easy reach of London and the chief Essex watering-place.

ROOD-SCREEN, RANWORTH CHURCH, NORFOLK.

As promised, when we gave the double-page sheet of general drawings and details of this magnificent screen in the BUILDING NEWS for Nov. 15th last, we now publish, with the permission of the Norfolk and Norwich Archæological Society, some further illustrations, by Mr. C. J. W. Winter, of the figure panels from the same masterpiece. Taking them in the order in which they are grouped on our plate, we have from the north wing, or parclose screen, the figure of St. Stephen (left-hand top corner), Proto-martyr, vested as a deacon, in alb and green dalmatic, holding in his right hand a napkin containing stones, the instruments of his martyrdom, and in his left a book. Next in order is an archbishop, whose name is unknown. His figure is from the south wing, or parclose screen. Dr. Husenbeth supposed this figure to represent St. Thomas (à Becket) of Canterbury. The letter observed on the orphrey of the chasuble, apparently the initial "T," would confirm this supposition. The vestments are the alb and tunicle, dalmatic and chasuble. The archi-episcopal pall is pierced and kept in its place on the vestment by small pins in the form of crosses *patée fitché*, which gave origin to these charges in the arms of the See of Canterbury. St. Lawrence Martyr stands next on the sheet; his figure comes from the same wing. He is habited as a deacon—albe and red dalmatic—his left hand resting on a gridiron, the instrument of his martyrdom, and his right hand a book. Below these on our plate to the left is St. Mary the Virgin with the Holy Child, to whom the Virgin mother holds the left breast. St. George, clothed in armour, striking a dragon with his sword, comes next. The surcoat and shield are both charged with St. George's cross *gules* on a field *argent*; the costume and armour are of late character, subsequent to 1450, and worthy of observation as helping to determine the date. St. Barbara V.M. is the last saint represented here to-day. She bears in her right hand a tower, her usual attribute, and in the left a palm branch—emblem of martyrdom. The design of the diaper on the robe is remarkably rich and beautiful, but of late character. Mr. F. M. Elgood lends us the originals of these illustrations.

ABBOT'S HOSPITAL, GUILDFORD.

A FEW facts in the history of Abbot's Hospital, Guildford, which we illustrate this week, may be interesting. Abbot's Hospital, High-street, Guildford, was founded in James the First's reign, in the year 1619, by George Abbot, Archbishop of Canterbury, for a Master, twelve Brethren, and eight Sisters. George Abbot was born on the 29th of October, 1562, and was the second son of six, his father being a cloth-worker.

His mother dreamt that, if she could eat a jack or pike before her child's birth, that he would become a great man. This so impressed her, that she tried indefatigably, but unsuccessfully, to obtain one, till one day after dipping water from the river she found the desired fish in her pail.

This she cooked at once and ate; and on the circumstances becoming known, when the child was born, several persons of quality came forward and offered themselves as sponsors, and undertook his education. He rapidly advanced, and eventually became Primate of England.

The hospital is built of red bricks, with stone dressings round a quadrangle about 66ft. in breadth and 63 in depth. In the centre of the front is a tower, with an octagonal turret at each corner, and the main entrance is through an archway, around a moulding of which runs the motto "DEUS NOBIS HÆC OTIA FECIT."

The hall is wainscoted, and has an enriched facia and cornice, and the chapel adjoining has a lofty roof and large windows in the Perpendicular style filled with stained glass, illustrating the History of Jacob. This glass is said to have been brought from a neighbouring friary, executed from designs by Albert Dürer.

Some doors, chimneypieces, and the Master's staircase afford splendid examples of Jacobean woodwork. The chapel is still used for service twice a day, conducted by the Master or Vice-Master.

The house is governed by a Master, who must be Rector of Trinity Church (opposite the Hospital) or the Mayor of Guildford, and be unmarried, and he and five Brethren appoint a Vice-Master who lives in the house. Inmates must be 60 years old, unmarried, and have lived in Guildford twenty years. A view of the building by Mr. Edwin Hardy was given in the BUILDING NEWS for June 24, 1881.

HARRY HUTT.

An organ, built at a cost of £500 by Messrs. Foster and Andrews, of Hull, was dedicated on Friday in the parish church of Cadzow, N.B.

WAYSIDE NOTES.

BOUT three-fourths of the buildings erected by the London School Board, said the *Daily Telegraph* of Tuesday last, have, on the authority of an "expert" who has studied the question, been badly constructed! Good old School Board! Sorry old contractors! There is nothing like having a thing thoroughly whilst one is about it, and in this case none will deny that somebody, or bodies, has or have made a thoroughgoing business of affairs, for which the London ratepayers, never too good-tempered when settling with the collector of school rates, will bring him or them to book.

When, long enough ago, you repeatedly called attention to the existence of an exceedingly grave state of things in connection with the buildings erected by the School Board, many were inclined to doubt whether your views of the case were warranted by facts; but now all will see how correct was your judgment, and how accurately you foretold the ultimate exposure of a public scandal which, having become generally known, will have to be investigated to the core. Then, if one may reason from the information already made public, the affair will be a regular "eye-opener." For the practical report of the whole business is that many millions sterling of Londoners' money have been expended without a just *quid pro quo*. Indeed, it is worse than this, for deficient construction means a constant and ever-recurring bill for structural repairs, which, in the case of so large a number of buildings, amounts to a most serious item in the yearly expenditure. I therefore renew my hope, expressed months ago, when you first called attention to the matter, that the shameful record," as it appears in the leading of the article in the *Daily Telegraph*, above referred to, may be the subject of a piece-meal investigation.

It is impossible, and would be most unjust, to attempt, at the present time, to lay blame on any party or parties. So to do will be other persons' business. But we can certainly wonder at the unwholesomeness of a system that should lead to such deplorable results, and we now express little surprise that there should be differences between the Board and the contracting fraternity. And we can reason and moralise until we come naturally to the proposition that the direct cause leading to the ultimate effect must have been inefficient or ineffective supervision. Young architects there are who, feeble and despicably weak, to a degree, are led by the nose by unscrupulous contractors; but who will say that a corporate body, elected by the ratepayers of the largest city in the world, can excuse themselves for being thus bamboozled, without convicting themselves of one or more culpable shortcomings in their organisation? And I make use of the present scandals to emphasise what I have urged often before, and that is that the system of placing the whole supervision of a vast number of important buildings in the hands of one architect and staff is radically wrong. In a city like London, the amount of work is necessarily such as would at times, if not permanently, baffle the efforts of the most conscientious and hard-working of chiefs and of his assistants. I venture even to suggest that the organisation of the London School Board requires to be remodelled and placed upon a basis that will in future insure sounder results.

There might be one supervising board and many district boards, each having its architect and the overboard its architectural adviser. Or, what would perhaps be better, the district boards might put their work out to competition. Anyhow, a subdivision of the duties of watching over the erection of the schools, instead of its concentration, might, in this case, lead to excellent results. There would then be a large number of architects to see that the work was done as it should be. As I have before hinted in the matter of regulation School Board details—Nos. 1, 2, 3, &c., &c., &c. (!)—ordained to be introduced into the elevations and full scale drawings for new buildings by the members of the Architects' staff as prescribed by the superior,—there would certainly be a benefiting of London and scholastic architecture. And instead of the architectural profession being yearly done out of tens of thousands of pounds of commission, it would receive its due, by which the ratepayers would benefit. Is not the scheme good, and justified by reason and common-sense? Anyhow, I intend to do what I can to put the suggestion before people.

Until inquiry shows otherwise, I shall refer the present trouble, primarily, at any rate, to system rather than to individuals, and declare that the attempt to deal with the building of so large a number of schools is too much for any one body to manage. Whatever may be the result of any investigation that may be made, I shall argue for the splitting up of the large body into many smaller ones, retaining, however, a central authority. It must be remembered that the School Board for London is actively and positively engaged in most extensive building undertakings, where, except for a few fire-stations and occasional miscellaneous works, the County Council is merely acting negatively as a general supervising authority. It is not therefore of any purpose to say that because a corporation like the County Council can manage with one architect, that therefore the School Board can do the same. And, after all, the C.C. has many—very many—deputy architects, to wit, the district surveyors.

Every architect knows the difference between working to the letter of a specification and in its spirit. What holds good with respect to specifications is true in regard to building by-laws. An unscrupulcus builder may appear to have done all that was required of him by authorities; but the surveyor knows this to be very far from the truth. Yet he has no power, in many things, of enforcing the builder to comply with his just demands. I am speaking now of jerry-builders and district surveyors. There are certain weak points in the defences which keep the City of London from becoming one mass of rotten, tottering tenements, that are well known to Mr. Buggins, his friends, and relations. It is, therefore, with a sense of relief that one turns to the report of this week's County Council meeting, and finds that at last there is to be an endeavour to remedy these defects in legislation. It will be remembered that some time back the matter was referred to a sub-committee of the Building Act Committee. We now learn that representations have already been made to the Parliamentary Committee with a view to the amendment, in certain respects, of the existing law. It is about time such a course were taken. To have a large number of properly-qualified surveyors at hand, and to render their efforts abortive by inefficient legislation is mere vanity. As matters at present stand, Mr. B. may impudently clamber through the weak points in the defences, and laugh at the remonstrances of the poor D.S., who, if conscientious, perhaps gets in addition a smack in the face from English "Justice," forsooth, for proof of which keep a constant eye upon the "Legal Intelligence" in the BUILDING NEWS. I do hope these reformations in by-laws for Metropolitan builders are not to be a mere farce, but that they will be just such added power in the hands of the district surveyors as may prove something more than a snaffle-bit to Buggins and Co.

Is the good old trimmer-arch to die out? The question occurs to me here because in my walks abroad I see substantial buildings fitted with a wretched film of concrete on laths, in place of the trimmer—an invention of the "jerry" builder.

The defects of the New Law Courts come to the front once more. This time it is touching the ventilation of Court of Appeal No. 2. Sitting therein on Monday last, Lord Justice Bowen complained that the atmosphere was intolerably foul, and gave it as his conviction that foul air was actually being supplied where fresh was supposed to enter. Lord Justice Fry said he entirely concurred in the observation of Lord Justice Bowen, expressing a wish that the Government would either supply them with pure air or allow them to break the windows and supply themselves. Possibly there is something wrong with the drainage somewhere about the neighbourhood of Court of Appeal No. 2, in which case Government might hurry up and see that something is done, and not cause one Judge to be rendered ill, and two others to so sorely and justly complain. Anything more revolting to an English gentleman than to be compelled to work in a disgusting and polluted atmosphere it is difficult to conceive. In an ordinary police-court we, for some unexplained reason or another, expect to find a filthy, nauseatius atmosphere; but surely such a state of things is a disgrace to the authorities, when found in the National Palace of Justice!

Apparently, however, the Government are as badly off as any Lord upon the Bench. Speaking last Tuesday night at a dinner given by the Plumbers' Company at the Fishmongers' Hall, Mr. Ritchie, M.P., said that "notwithstanding all the efforts of all the architects and all the sanitary inspectors, called in at the expense to the nation of thousands of pounds, the members of the House of Commons lived in an atmosphere redolent of the foulest odours that could be imagined, and seriously prejudicial to the health of legislators (laughter and applause)." I don't see myself where the laugh comes in; but that possibly is because I am not well lined with calipash and calipee. It seems to me a very disgraceful and abominable state of things.

As I have said before, the plumbers are, in virtue of examination and registration, the coming men. Mr. Ritchie hoped that the Plumbers' Company would direct attention to the House of Commons, which, be it noted, the architects, &c., have failed to cure. Verily, he must be thinking of taking the back seat.

So Lord Grimthorpe wins the day. What is to happen now? Although there is no truth in the rumour that the grand Norman turret will be shortly demolished, and an entirely new design take the place of the present Lady-chapel, we may be sure that Lord Grimthorpe is chuckling over the manner in which he will now be able to startle the architectural and artistic world by his future exploits. By the bye, do readers of the BUILDING NEWS know what is done with the old stones—such as those that are taken from the original clerestory windows of the presbytery? *They are buried in the thickness of the new walls*—lovely fragments that one would deem worthy of a place in any museum! *Buried in the new walling!* I have the authority of a mason at the Abbey that this is so. When recently visiting the abbey I noticed many lovely little caps from the clerestory windows, sharp and clear in mould as the day they were worked, and the man vouchsafed me the information that they would be built in the new masonry.

Anything more preposterous than the "design" by Lord Grimthorpe for the west-end of the abbey it would be difficult to conceive. It reminds me of nothing so much as the attempt of an infant of tender years to scrawl an imitation of the elevation of the most incompetent architect the world has seen. Heaven defend us from a realisation of the monstrosity in design prepared for the cruciform space on the high altar screen! It appears probable, however, that our every fear may now be realised. Truly, we live in strange times.

GOTH.

CHIPS.

A number of the officials of the Manchester, Sheffield, and Lincolnshire Railway Company visited Hawarden on Saturday, to attend a presentation by Mrs. Gladstone to Mr. Arthur Cochrane, of London, contractor for the new swing bridge over the Dee. Mrs. Gladstone, on behalf of the Railway Company, presented Mr. Cochrane with a chiming clock, in recognition of his services in the superintendence and erection of the Hawarden Bridge over the Dee.

At Peterborough on Saturday evening the Right Hon. A. Peel, Speaker of the House of Commons, entertained at dinner about 100 of the employés of Mr. John Thompson, the ecclesiastical contractor, who have recently been engaged in making additions to Sandy Lodge, the Speaker's residence.

A statue of Balzac, the work of M. Fourner, was inaugurated at Tours on Monday.

Mr. E. A. Walton, A.R.S.A., has received a commission from the Glasgow Town Council, following the usual custom, to execute a portrait of ex-Lord Provost Sir James King for the Corporation Galleries, and a replica will be presented to Lady King.

The promoters of the Beverley and East Riding Company, who obtained authority last year to construct a line from Beverley through the plain of Holderness (now altogether unserved by railway), have applied for Parliamentary powers to extend the railway so that it may join the Hull and Barnsley system at Little Weighton, five miles north of Beverley, and run through to Bridlington Quay.

Building Intelligence.

Morley, Leeds.—St. Mary's Mission Hall, Middleton-road, Morley, was opened on Thursday, the 21st inst. The design of the building is Classical. The front faces Middleton-road, is gabled, and is built of local pitched stone. The large hall, which is 48ft. by 31ft., and 23ft. high, and has accommodation for 250 adults, is spanned by partly open-dressed roof trusses with ornamental spandrels. The pulpit is a relic of the old church. Behind the hall are two vestries and infants' schoolroom, and heating-chamber under vestries. All the internal fittings are of dressed pine. The building throughout is heated by hot water on the high-pressure system. The contracts have been carried out by local contractors, under the superintendence of the architect, Mr. T. A. Buttery, Queen-street, Morley.

Rotherham.—At a meeting of the Rotherham Board of Guardians on Monday last, the recommendation of the committee was unanimously approved with regard to the proposed enlargement of the workhouse. The enlargement includes taking down the greater portion of the present buildings, and providing new tramp and receiving wards, lunatic wards, board and relieving officer's rooms, master's house and offices, able-bodied blocks for men and women, with large day-rooms, children's and nursery day and night rooms, bath, lavatories, &c. New dining-hall to accommodate 350, kitchen and scullery, fitted with complete steam cooking arrangement, bakery, stoves, &c., also laundry, washhouse, &c., with steam washing appliances. New foul wards and isolation hospital, also workshop, stables, wood-sheds, &c., and complete rearrangement of the whole of the drainage. The estimated cost of the above scheme is £22,000. Mr. H. L. Lacon, of Rotherham, architect to the Board, has prepared the whole of the plans and specifications, which have been approved by the Local Government Board, and the work is to be commenced as soon as possible.

St. Neot's, Cornwall.—The parish church of St. Neot's, near Bodmin, which was dedicated on Oct. 14th, 1321, on the site of a more ancient fabric, was reopened last week after the completion of a second instalment of restoration, effected at a cost of £850, from designs by Mr. G. H. Fellowes Prynne, of London and Plymouth. The church was partially restored five years since at a cost of £600. Mr. R. M. Rowse, of Portland-place, Plymouth, has been the contractor for the principal portions of the present works, including the renovation of the chancel roof, the decoration of the same, together with the decoration of screens, the laying down of the tiles of the centre and south passages, and the repairs to tower roof. Messrs. Fouracre and Watson, Stonehouse, have decorated the eastern wall, and also the choir stalls. Mr. Richard Marks, of St. Neot's, did the replastering of the inside walls and part of the church roof. Mr. Thomas Northcott, of St. Neot's, executed the seating of the south side of the church, the north side work having been done by him at the former restoration. Mr. Harry Stokes, of Woodbury, Exeter, has carried out the rehanging of the six bells, and the organ was repaired by Messrs. Hele and Co., of Plymouth.

Southampton.—The new Roman Catholic Church of St. Edmund, in the Avenue, was opened on Wednesday week. The building consists of a nave, 82ft. by 49ft. 8in. internal measurement; sanctuary, 29ft. 3in. by 27ft.; Chapel of Our Lady, 26ft. by 10ft. 6in.; organ-loft over the sacristy, 25ft. by 11ft., with large arch opening out into the sanctuary. There are two sacristies on the south side. The total length of the church is 122ft., and the greatest width 61ft. Fourteenth-Century Gothic is the style adopted, and the building is of red brick, with Hamhill stone dressings externally, whilst the roofs are covered with Broseley tiles. The nave arcades consist of five bays, with octagonal piers having moulded capitals. The whole of the internal stonework is of Bath stone, and the plain spaces between are plastered. The roofs are of pitch pine with king-post principals and traceried windbraces to the purlins and pole plates. Duffey's wood-block paving is used for the floors, that of the sanctuary being of oak. The screen to the chapel is of six bays of moulded oak tracing, filled in with brass-work, and surmounted with carved goblets and pinnacles. The porch inside the main entrance is also of oak. The benches are of pitch-pine and oak. The building is designed to be complete in itself without the tower, with an oak flèche upon the nave roof, rising 39ft. above it. A tower may be added in future, of five stages, and of a height of 180ft., the upper stage being of Hamhill stone, and finished with four large turrets and intermediate pinnacles. This is not, however, included in the present contract. The clerestory has ten windows of three lights each, and with flowing tracery—each window being different. Messrs. Westlake supplied the stained glass, and the carving has been executed by Mr. A. B. Wall, of Cheltenham. The contract has been carried out by Mr. W. H. Chapman, of Woolston, from designs by Mr. Lunn, of Portsmouth.

Stranton, Hartlepool.—After undergoing a thorough renovation, lasting over the principal portion of the present year, All Saints' Church, Stranton, was reopened last week. It is the parish church of West Hartlepool, is Perpendicular in style, and has been greatly defaced by a restoration of forty years since, when it was filled with high pews. The whole of the plaster has been removed and the walls repointed, while the old floors have been taken up, and the surface excavated to the depth of about a foot. The surface of the nave has been concreted and laid with wood blocks, and the chancel paved with red tiles, and new steps have been laid. The whole of the old seating has been removed, and replaced in the nave and north chapel with oak benches, and stalls for churchwardens at the west end. The walls have been panelled with a dado from the old oak seating to a height of 5ft. The new pulpit is of oak, with panelled and traceried front, resting on an octagonal stone base. The chancel fittings are all of oak. The new choir and priest stalls have traceried fronts and carved poppy heads. A carved open traceried screen divides the sacrarium from the north chapel. A new organ-chamber has been added on the south side of the chancel. The old traceried windows have been built into the new walls. An organ has been supplied by Messrs. Abbot and Smith, of Leeds, at a cost of £800; the pipes are decorated, and the case is of panelled oak, richly moulded, from the design of the architect. A new stone font is to be placed at the west end of the south aisle. The soil around the exterior walls of the church has been excavated, and a trench formed, so as to prevent the damp arising from the churchyard. Messrs. Suggitt and Son were the contractors for the mason work, and Messrs. Clark and Co. for the carpenter and joiners' work. The total cost of restoration has been about £1,500. The work has been carried out from plans, and under the superintendence of Mr. J. H. Morton, of South Shields. It is intended at some future time to place new roofs over the nave, aisle, and chancel, so as to complete the restoration.

CHIPS.

The annual dinner of the Society of Engineers will take place at the Holborn Restaurant on Wednesday week, the 11th prox.

The foundation stone of a masonic hall was laid in George-street, Dumfries, on Saturday. The building will be two stories in height, the meeting-room for the lodge being on the first floor, and the grand story being let off as a school. Mr. Cromwell is the architect, and the cost will be £1,300.

A new entrance is being made to the park at Membland, Devon, for Lord Revelstoke, under the superintendence of Mr. G. W. Crosbie, the resident estate architect. The gates will be of hammered iron, and will be wrought by Mr. de Wilde, of Archer-street, Shaftesbury-avenue, W. The granite piers will be surmounted by the Revelstoke supporters, a rampant bull and a muzzled bear. These latter will be in red Corsehill stone from the Dumfriesshire quarries, and Mr. Harry Hems, of Exeter, is commissioned to carve them. The two blocks designed for this work weighed, in the rough, 9 tons 7cwt. and 7 tons 7cwt. respectively.

Lady Clark on Saturday cut the first sod of the International Exhibition of Electrical Engineering and General Industries which is to be held in Edinburgh next year, in commemoration of the opening of the Forth Bridge. Mr. Allan Carter is the engineer and architect.

Mr. G. W. Davies, builder and contractor, of Liverpool, died rather suddenly on Saturday. His father was superintendent of works at the building of the Liverpool Customs House, and he himself had many important contracts, notably that with Messrs. Lewis and Co. after the great fire at their Liverpool premises.

ARCHITECTURAL & ARCHÆOLOGIC SOCIETIES.

Edinburgh Architectural Association. The winter session of this association was open last (Thursday) evening, when a paper "Egyptian Architecture" was read by M Conway. The following is the syllabus for t session, the meetings being held on Thursd evenings, and the visits on Saturday afternoon 1889: Dec. 12th, "Bye Paths in Architecture by G. S. Aithen. 1890: Jan. 9th, "Son Early Scottish Architects," by J. Balfour Pa Advocate; Jan. 23rd, "Symbolism," by Re Edward Sugden; Feb. 6th, paper by John Kir ross; Feb. 20th, "Ingress and Egress f Public Buildings," by Henry F. Kerr; Feb. 22n visit to Parliament Hall, Argyll Tower, and S Margaret's Chapel—Leader, Mr. Blanc; Marc 8th, visit to Free Library and Old Universit Buildings—Leaders, G. Washington Brown and Professor G. Baldwin Brown; March 20th "Electric Lighting of Interiors," Principa F. Grant Ogilvie; March 29th, visit to Preston Preston Cross, Prestonpans Church, &c.; Apri 10th, "Accessories of Architecture," by John Keppie, President Glasgow A.A.; April 19th visit to Gosford and Red House—Leader, Mr Rhind, sculptor; May 3rd, visit to Tantallo Castle—Leaders, Mr. McGibbon and Sir W Hamilton Dalrymple; May 17th, visit to Bridg Castle and Torphicken Church—Leaders, Mr Thomas Bowman and Mr. C. Johnston; May 29th, President's Closing Address; May 31, Annual Excursion, Dunfermline, Inverkeithing, Fordell, Pitreavie.

Glasgow Architectural Society.—At a meeting of this society held on the 21st inst., Mr. David MacGibbon, architect, of Edinburgh, read a paper on "Ancient Scottish Domestic Architecture." The characteristics of Scottish architecture, he said, were wide and varied in styles. From the earliest periods to the 17th century it was peculiarly and markedly national, and different from that of other countries. It also adapted itself to and was found suitable for all the varied wants and requirements of the country during that long period. As regarded architectural effect, it also possessed many picturesque elements.

Manchester Society of Architects.—The members of council elected for the year 1890 are —president, Mr. R. K. Freeman, F.R.I.B.A.; vice-president, Mr. J. Medland Taylor, with Mr. E. Salomons, F.R.I.B.A., Mr. W. A. Royle, F.R.I.B.A., Mr. T. Worthington, F.R.I.B.A., Mr. Murgatroyd, F.R.I.B.A., and Mr. J. G. Elgood, A.R.I.B.A., and Mr. John Ely, F.R.I.B.A.; and Mr. Paul Ogden, A.R.I.B.A., hon. secretaries.

Leeds and Yorkshire Architectural Society. —The annual dinner of this society was held at the Queen's Hotel, Leeds, on Monday night. Mr. Henry Perkin, the president, occupied the chair, and about 100 members and guests were present. Mr. George Corson gave "The Army and Navy," to which Colonel T. W. Harding responded. Mr. W. Lavies Jackson, M.P., acknowledged the toast of "The House of Commons," proposed by Professor Ransome, and Mr. J. J. Willson and Col. Wilson then replied to the toast of "The Fine Arts," given by Mr. W. H. Thorp. The toast of the evening, "The Leeds and Yorkshire Architectural Society," was proposed by Mr. F. H. Wigfall, and responded to by the President, who said that in entering upon the second session of his term as President, he hoped to do his best to increase the membership of the society, both as regarded practising members and honorary members.

York Architectural Association.—Mr. W. G. Penty, F.R.I.B.A., delivered the presidential address at the opening of the session of this association on Thursday night, the 21st inst. He congratulated the members, 53 in number, on the prosperity and increasing usefulness of the association. Architects and builders would, he said, welcome the new by-laws of the York Corporation, as their instructions would be more definite. In reviewing public improvements, the president alluded to the necessity of widening Nessgate, and paid a compliment to Mr. George Styan, the ex-city surveyor, who prepared the original plans for the City Walls restoration. In a lengthened allusion to wood pavement, Mr. Penty regarded it as an expensive luxury for the ratepayers of York, though wooden blocks have their advantages as

well as their disadvantages. He offered several suggestions in regard to laying the pavement and forming the foundations. Remarks were made upon the new municipal building which is being erected adjoining the Guildhall, and an approving reference to the plans of the new courts of justice, &c., in Clifford-street; a suggestion being offered, however, that if a few thousands were added to the contract price the structure would be more pleasing, more in accordance with similar works in other towns, and far more satisfactory to the architects.

COMPETITIONS.

Richmond, Surrey.—In the competition for new municipal buildings the Richmond vestry have finally selected the design under motto "Bon Espoir," the work of Mr. W. J. Ancell, 3, Staples Inn, W.C., to whom the assessor (Mr. James Edmeston) did not award either premium. It will be remembered that Mr. Edmeston awarded the first premium to Messrs. George Elkington and Son, 95, Cannon-street, E.C, and the second to Mr. T. Verity, 11, Jermyn-street, S.W. At the vestry meeting at which this recommendation of the committee was adopted, strong comments were made on their conduct in thus depriving the premiated architects of the legitimate reward of their success in the competition, by the Rev. C. F. Coutts and others; but it was carried by twelve votes to four.

Sidcup Cottage Hospital.—Sixty-eight designs were received in competition for the Sidcup Cottage Hospital. A member of the Institute was called in to assist the committee in selecting the most suitable design. After several meetings, the drawings submitted by Mr. Sidney G. Goss, A.R.I.B.A., of 48, Finsbury-circus, E.C., were selected. Mr. Goss has now met the committee, and has been instructed to prepare working drawings, and to obtain tenders for the work, forthwith.

CHIPS.

A bronze statue of the late Mr. Alexander Balfour, erected in St. John's-gardens, Liverpool, by public subscription, was unveiled on Saturday last by the Rev. Canon Ellison. The statue is the work of Mr. A. Bruce Joy, and the pedestal is of grey granite, from the Bessbrook Quarry, Newry.

The accounts filed under the failure of Alexander McEwen, railway contractor, of Cannon-street, London, show gross liabilities £51,463, whereof £40,160 are fully secured, and assets £7,643. The assets mainly consist of shares in American mining and railway securities, the values of which are purely nominal.

The remains of the late Mr. George Jackson, of the Architect's office in the Guildhall, who died on Sunday week, were interred in Abney Park Cemetery on Thursday, the 21st inst. The chief mourners were Mrs. Jackson, the widow, and the brother of the deceased. The high esteem in which Mr. Jackson was universally held, and particularly by his colleagues at Guildhall, was testified by the presence of 87 of his friends at the graveside.

A new post-office has been opened at Dartmouth. It occupies part of the ground floor and basement of the Railway Hotel, and the public offices have an area of 60ft. by 22ft. Messrs. Hayward and Wooster, of Bath, were the contractors for the reconstruction and fittings.

The Southampton harbour board at their last meeting received a report stating that the dredging operations had been completed at a total cost of £33,805. The members voted a hundred guineas to Mr. Burbridge, the harbour master, in recognition of his special services in connection with the undertaking.

It has been decided to erect a statue to the memory of the late Hon. F. J. Tollemache, formerly M.P. for Grantham, in that town. Mr. George Simonds, of St. John's Wood, London, has been commissioned to carry out the work. The statue, which will be of bronze, is to be 10ft. in height, with a base not less than 9ft., of Aberdeen granite. The cost will amount to £1,000.

The council of the Yorkshire College at Leeds have elected Mr. John Goodman to succeed Professor Barr in the chair of Civil and Mechanical Engineering. Mr. Goodman, who is twenty-seven years of age, is at present chief assistant at the Broadway Testing Works and Chemical Laboratory, Westminster. He has had twelve years' experience in engineering work, and has gained from the Institution of Civil Engineers, of which he is an Associate-Member, a Whitworth Scholarship, the Miller prize for original scientific research, and the Miller Scholarships for 1886 and 1887.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

"BUILDING NEWS" DESIGNING CLUB.

SECOND LIST OF SUBJECTS.

C.—A cemetery chapel for a Church of England burial ground, with lodge for sexton adjoining. The building is to stand at the entrance of the graveyard by the side of the main central roadway into the grounds, and the entrance gates are to form part of the scheme. The chapel is to be 30ft. long inside, exclusive of altar space, which may be in a small chancel or apse. Width of chapel 20ft. inside. Provide a vestry 10ft. square with fireplace. At the west end over the entrance a small gallery affording space for a choir of three men and three boys, as well as a small organ, is to be included, with an external stair turret leading to same from vestry. Put a simple bell turret, chapel to be warmed with hot-water radiators. Lodge to comprise sitting-room (14 by 12), kitchen (10 by 12), scullery and offices, and two bedrooms. Style Geometrical Gothic, materials stone and brick, roof tiles, pair of gates of wood hung on stone piers 10ft. apart. Put a small gate 4ft. wide on one side next lodge. Scale 8ft. to the inch. Plans, two elevations, section, and sketch.

Drawings Received.—"Berkie," "Glaucus," "McGinty," "Mac," "Bumblechump," "West Anglian," "Dot," "Schplüttermückischen" (Why adopt such a foolish nom de plume?), "Sarchedon," "Rock," "Multum in Parvo," "North Star," "Renaissance," "Fiddler," "Cassowary," "Labor Omnia Vincit," "Reference," "Horse-shoe," "Medicus," "Chamfer," "Haste," "Niger," "Jack," "Skull and Crossbones," "St. Magnus," "Jerry," "Goth," "Lycidas," "Spider," "Streona," "Nox," "H." in a square, "Anvers," "Robinhood," "Dono," "Koko," "Orme," "Syak," "K. W. T.," "Pat," "Q. E. D." "So and So," "Coverac," "Signum," "Gamekeeper," "Rustic," "Lux," "P. R. G.," "Westward-ho," "Wallaby," "Cyclist."

McGinty. (No name or address given. Send particulars at once.)

E. and N.—A. K.—B. and Co.—S. and C.—A. Y.—X.—N. E. T.

Correspondence.

THE LONDON BOARD SCHOOLS.

To the Editor of the Building News.

Sir,—In view of the great stir now being made in reference to the so-called School Board Scandals, and of the very disparaging manner in which our name has been brought before the public, and of the gross exaggerations indulged in at our expense, we ask you, in justice to ourselves, and in the interest of the building trade, and for the information of the ratepayers, to insert this letter.

We have already published a public denial of the charges made against us as builders of the Woodland-road school, and we repeat our request that the public, who are pecuniously interested in the matter, should visit that school, or any of the forty other schools which we have built for the Board, and judge for themselves.

We deny that any burnt clay is used instead of sand; but sufficient sand was sent on to the works by the same parties who supplied the works of the L. B. and S. C. Railway station close by, which was being erected at the same time by another contractor. The Portland stone was supplied by one of the largest and best firms of Portland quarry owners, and at the best market prices.

We went to the extra expense of using bricks known as "shippers," at double the price of stocks, which were specified for the external work. As to the roofs, the quality of the Broseley tiles does not appear to be called in question; but stress is laid on the fact of our having used shorter nails than specified, and only *one* to each tile. The nails used are long enough to go through the tile and the boarding or lath, and only one was used instead of two, by the express orders of the clerk of works, so as to save splitting as far as possible, and to make it more easy to effect repairs to the tiling, when necessary, than would be the case if two nails were used.

As to the lead on the schoolkeeper's house, this small building is what is understood as a prime cost item in the contract, and so measured up by the quantity surveyor on completion, and we are thus paid for the work actually done.

The allegation as to the lead pipes, which looks very sweeping on paper, is incorrect, inasmuch as we have simply been paid for what we have put in; but the charge that the pipes are 1lb. and 2¾lb. per yard respectively short weight, we have do doubt will be found to be as incorrect as was a similar charge in the case of two other schools, where they were tested and found to be over the weight required. As to the external paint-work not being in a good state, it must not be forgotten that after four years external paint-work is likely to be perished, even if painted five coats as new work. It is common knowledge that in an ordinary house, let on repairing lease, the usual provision is, as to external painting, that it should be renewed every three years.

As to the glass, it seems a most ingenious idea to spend the ratepayers' money to take out glass and re-glaze, to see whether it is 21oz. or 26oz. glass. We wish to say, as to this, that we shall prove having paid for 26oz. glass, and we do not believe the firm who executed the glazing has deceived us.

We will pass over the other matters as unworthy of remark, except the statement that no concrete is under the boarded floors to cover the wet clay, with the result that wet rot has set in. This looks, in print, very bad, as an insinuation intended to suggest to the reader that it refers to the whole ground-floor of the school buildings. The truth is that the whole of the ground-floors in the school building are solid block flooring, executed in the usual way, with concrete bed, &c., and the only floor which can be referred to is that of a small room in the schoolkeeper's house, the method of dealing with which has been before referred to.

The report of the "superior officer" in respect to the Woodland-road school was, we understand, sent in due course to the clerk of works for his reply, hereto. This is the same report that was read by the chairman of the Works Committee, and we have reason to know that the clerk of works made an exhaustive reply to the various items. This reply was in the hands of the Board before the said report was read; but for some reasons (doubtless sufficient, but unexplained), the reply of the clerk of works was not referred to. We have nothing to say as to the clerk of works, excepting that he was a good and faithful public servant, and not a man who could be credited with showing any builder undue favour. The Board have their own way of dealing with him; but as he is implicated with our work, we must be allowed to refer to him.

Stress has been laid on the fact that we have received some £325,000 of the ratepayers' money. We beg to confirm that, and feel proud in saying that we have built 40 schools for the Board, and

want of space only prevents our publishing a list of the schools, so that attention could be directed to them by those who feel disposed to see the nature of the work we have done. We take this opportunity of stating that we have always paid the full rates of wages, and bear a good name among all classes of workmen in that respect.

We desire to draw attention to the vast difference existing between the present system with results of tenders and what took place in the past. During the earlier days of the Board it was a recognised fact that the limit of expense for a new building should not exceed a certain rate per head of accommodation (£10); but we notice that recently the estimates for new buildings exceed that figure in some cases by 100 per cent. This fact clearly needs some explanation from those whom the ratepayers have put into authority to spend their money.

It has been mentioned that the Board have an action pending against us in reference to certain so-called defects discovered at Kilburn-lane Schools, finished by us four years ago. We are willing to stand by the result of that action, and wish it to be known publicly that the Board have striven to get the case referred to a referee, and had obtained an order to that effect. We are happy to state that we have been enabled to get the order reversed, and the action will be brought before a judge and jury in due course, where we can vindicate our reputation before the public.—We are, &c., WALL BROTHERS.

Carlton Works, Carlton-road,
Kentish Town, N.W., Nov. 27.

SIMILARITY IN IDEAS.

SIR,—It is remarkable to what extent two minds may conceive the same idea. The illustration published in your number, Nov. 15, of a Welsh Church in Cardiff, is a striking instance of this, the author having (of course unconsciously) produced in his design for the tower an almost exact copy of the corresponding feature of Mr. J. Oldrid Scott's church at West Ham, illustrated in your paper of Nov. 23, 1885.—I am, &c., X. Y. Z.

GLASGOW ARCHITECTURAL SOCIETY.

SIR,—In the report given of the address by the President on "Progress in Architecture," I was somewhat surprised to find him asking "Coming down to the last thirty or forty years, has Glasgow done anything in the way of progress?" Surely it was known to him that within this period there had flourished in Glasgow one of the greatest of modern Classicists—Greek Thomson, an architect in whose works are seen rare creative genius and the highest culture. Thomson's endeavour to improve the public taste by presenting to it buildings designed in a manner worthy of the time of Greek art when at its zenith might, I think, be considered something in Glasgow in the way of progress.

I see that the second competition for the Thomson Travelling Studentship is announced—"the style to be Early Classic." "Classic" is so exceedingly elastic that some term more definite seems to be desirable. The first competition was fairly won; but it is not easily to understand why the travelling student was sent to study and sketch a style which was to Thomson an utter abomination. My idea is that in the travel, as well as in the competition, there ought to be some recognition of the principles of Thomson; and those who wish to know what these are might look at his buildings and read his lectures. As

"Such plays alone should please the British ear
As Cato's self had not disdain'd to hear,"

So in the forthcoming competition a study in "Greek Architecture of the Period of Pericles" (instead of the vague "Early Classic") might endeavour after, if it did not accomplish, something worthy of being associated with the name of Alexander Thomson.—I am, &c.,

HYPERX.

APPLIED MECHANICS FOR ARCHITECTURAL STUDENTS.

SIR,—The method given in the second article on the above subject to obtain the stresses in the rafter and struts in Figs. 5 and 6 does not appear to be correct. The load at E, Fig. 5, should be resolved directly along the rafter E B and the strut E D, instead of being done by the two operations mentioned in the article. This would give greater stresses than those obtained by the method given in the article.

There is no transverse stress in the strut. The stress conveyed by the kingpost to the rafters has been omitted. The above remarks apply to Figs. 5 and 6.

In Fig. 7 the load at D has been resolved directly along the rafter and the collar; but to be consistent, the same erroneous method adopted for Figs. 5 and 6 should have been used.

In par. 10 the letter *f* is referred to, but on Fig. 5 that letter is represented by *g*.

In Fig. 8, is not the shore kept in equilibrium by the action of the weight W, the reaction of the wall acting horizontally at A, and the reaction of the template on the ground at B, which three forces meet at A? If so, how is a stress at right angles to the shore produced?

What is the meaning of the sentence in par. 13 as to the load W causing a "contrary strain," &c.? This appears to contradict what is stated three sentences previously.

If these points could be explained I should feel much obliged.—I am, &c., H. C.

SIR,—Amusing myself by applying the text to Fig. 10 (p. 693 of last number), I do not find any explanation for the student as to why the point D is to be placed as marked. Why not at P? and then the diagonal line would fall outside the line of the pier, and so the pier fall. I presume there is some reason for the length F D not explained, or *must* the point D be just outside the line of wall? Or, if I draw K E parallel to A P, and then draw a diagonal, F E falling within the wall, I could draw up E D. But would this prove anything but guess-work? and not "what thickness or weight must be given to the wall in order to make it safe."—I am, &c.,

A CRITIC.

[To "H. C."—The method of treating the load at E (Fig. 5) was adopted in order to show exactly how that load acts on the rafter and strut. Supposing the strut to be away, then the load at E must cause the rafter to bend in the middle, which can only arise from a *transverse* strain at E acting at right angles to the rafter, so that the parallelogram E *a d b* represents the relation of the forces, E *b* being the transverse strain. The object of the strut is to receive this strain E *b*, and if the strut is *not* at right angles to the rafter, then E *b* must press obliquely on the head of the strut, and consequently produce a *transverse* or *bending* strain, as well as a longitudinal strain. The method usually adopted does not take notice of such transverse strain; but it exists, nevertheless. The strains in the directions of the different parts of the frame will be found in the graphic method described in Article III., which is the usual, or, as "H. C." would call it, the "correct" method.

Paragraph 10 refers to Fig. 6, not Fig. 5; and "*f*" was put in the original drawing, and we suppose the engraver intended the letter for an "*f*," although it might be taken for a "*g*."

As to the shore, the load W acting *obliquely* on the head of the shore causes a *transverse* as well as longitudinal strain.

The meaning of "contrary strain" caused by W in Fig. 9 is that *action and reaction are equal and opposite*, a well-known principle of mechanics.

To "A Critic."—The lines F D and F K are purely hypothetical, and in practical application must be taken to represent on scale the known values in lbs., cwts., or tons of the forces P and W. Surely this hardly wants explanation.

"An Architectural Student," whose letter is received but not inserted, is informed that the answer to "H. C." meets his first and second questions. The third only anticipates the graphic method which we give in article III. —ED.]

THE NUDE IN ART.

SIR,—Having just read carefully Mr. Horsley's paper at the Edinburgh Conference, it seems to me that the main point of it—and that a very important one—has been lost sight of, owing to its being associated with a violation of reasonable opinion in regard to the methods of study among lady painter-students. His real objection does not seem to be to all study of the nude amongst artists, but rather to the fact that all students of art, with whatever end in view—decoration, design, landscape, &c.—are compelled to found their studies on the nude by the present plan of education; and that this is a mistake all reasonable people must agree, for it is the object of all education, not so much to force all kinds of mind into one channel, but rather to provide ways by which every one may develop his natural endowments.

There are some minds whose instincts are toward decorative design applied to industrial products, and to compel them to study on the same lines as the figure-painter is as absurd as to compel a painter to found his style on architecture.

South Kensington was established to train decorative designers, and therefore has mistaken its office by adopting the methods of the Academy, which aim at training painters and sculptors.—I am, &c., AN ARTIST.

THE CHAMBERLAIN MEMORIAL, BIRMINGHAM.

SIR,—In your last week's issue you erroneously state in a paragraph relating to the renovation of the above memorial that it was erected in memory of the late John Henry Chamberlain, architect. Though well worthy of such honour, it is not in memory of a member of our profession that the fountain has been built, but, instead, it is a record of the successful municipal labours of the (now) Right Hon. Joseph Chamberlain, M.P.—I am, &c. S. HENRY EACHUS.

Bank Buildings, Wolverhampton, Nov. 26.

BUILDING CONTRACTS.

SIR,—The usual clause inserted in most contracts, as to "All material, &c., on being brought on premises, to become the property of the proprietor, &c.," appears to be useless, as in case of bankruptcy the trustees are able to claim such materials, unless there is a bill of sale, which must be registered and in the proper form. As a building contract is not the proper form, and the materials are from time to time changing, it would be useless to attempt it. As the materials are often considered in making up accounts for certificates, it is worthy of notice. The same thing, of course, applies to building agreements and advances.—I am, &c., R. S.

VENTILATION.

SIR,—"Give me air" might be the motto of the public speaker. Who that has been in the habit of addressing public gatherings of any kind but has found the extreme disadvantage which arises from the want of a sufficient supply of fresh air? A witty American preacher, attending a conference of his brethren in this country, on one occasion, when called upon to speak at the end of a long sitting, said that, while grateful for "the supply of air which the committee had provided," he was, for his part, anxious to "sample some of the leagues of atmosphere which the Creator had located overhead outside"!

It seems incredible, but it is a fact, that many churches, chapels, and public buildings are erected at the present time without any system of ventilation, as if ventilation was not of vital importance. Why is this so? Is ventilation possible? Surely yes. Is it too expensive to be carried out? No. Then why is it not done? That is a question for the architects.

Every adult vitiates in respiration from three to five cubic feet of air per minute. In an ill-ventilated room the atmosphere is soon loaded with organic matter and water, by exhalations from lungs and skin; and when gas is used, each burner consumes as much as five adults, all of which increases the wonder that provision for ventilation should not be the first requirement in planning a building for large assemblies.

Among the army of public speakers, outside the ranks of essentially professional lecturers—those, for instance, devoted to the promotion of temperance, religious, and social enterprise—how many are put under an entirely needless physical strain for want of air, not only while speaking, but during the waiting time, and—worse still—in *after effects*, such as headache, relaxed throat, and neuralgia? These observations are suggested, not by an isolated case here and there, but by a long experience of buildings of all sorts and sizes—some well ventilated, others only indifferently, the great majority badly, and not a few without any system of ventilation at all.

Having suffered from frequently speaking in ill-ventilated rooms, the writer has been led to make some inquiry into the subject. Examples of "how not to do it" are legion, and might be

quoted in abundance. It is more to the purpose, however, to briefly describe a couple of instances of "how to do it." First, instance the Free Trade Hall, at Manchester, seating about five thousand people, and frequently crowded (as at a recent "Alliance" meeting) by even a larger number. This great hall, which has been in use continually for twenty-eight years, is certainly one of the best ventilated buildings in the country. The result is obvious, in the freedom of the speakers from the depression inseparable from a vitiated atmosphere, and that of the audience from coughing, and other signs of irritation common elsewhere.

The system of heating and ventilating in use is at once comprehensive, yet simple. Atmospheric air, warm or cold, as needed, is admitted in sufficient volume (checked or increased by a regulating apparatus) through a series of "grids" inserted in the floor, over flues set in the basement, and running right round the hall. The upper part of the building is supplied with fresh air by means of shafts inserted in the thick walls. The egress of foul air is secured by outlets over each of the gasalier pendants, communicating in turn with vast horizontal flues plastered inside, running into upright flues at either end, and so to the outside atmosphere. The air in the building can be changed three times in an hour. The flues are placed over the ceiling of the great hall, and under the rafters of the roof; and one has but to test the rapidity with which the foul air passes through them to realise how effective the system is for securing a continuous supply of fresh air within the building.

Another example of a like kind may be found in Mr. Charrington's Great Assembly Hall at Mile End—probably the best ventilated hall in London. It also will hold about five thousand people, and, though filled to its utmost capacity, is remarkable for the comfort of speakers and people, secured by good ventilation.

Both these buildings are heated with Constantine's convoluted stove, which was adopted at Mr. Charrington's hall at the eleventh hour, and after another system had been determined on, with the remarkable result that it had been discovered that the warm air grids arranged for heating purposes provide in summer the requisite ingress for fresh air, thus securing improved ventilation.

During a recent visit to Manchester, the writer had the advantage of seeing a model of this particular stove, which appears to be perfect of its kind, being so arranged as to bring the maximum of heating surface into contact with the atmospheric air, while keeping fire and air separately from each other, to the manifest advantage of added purity in the latter. In the construction of this stove, provision is made for expansion and contraction of the metal, and for the largest possible radiating surface with a minimum of grate space—each foot of grate space giving nearly 100ft. of heating and radiating surface—secured by a series of hollow flanges or convolutions. The metal is everywhere protected from the direct action of the fire by fire-clay slabs and a casing of firebricks. As the air to be heated is by this system always drawn from the outside, and not, as is frequently the case, taken again and again from inside the building, the warm air supply is both abundant and pure.

Two of these stoves were fixed in the Assembly Hall at Mile End; but Mr. Charrington states that only one is required to be used. The convoluted stove answers every requirement, whether to produce the high temperature of a Turkish bath, or for the rapid and economical warming of public buildings. It sufficiently warms such buildings as the Free Trade Hall, containing 500,000 cubic feet; and Mr. Charrington's Hall in London, with 500,000 cubic feet—the largest mission-hall in this country. It is an economical system, as may be seen from the fact that the Manchester Royal Exchange is kept at a comfortable temperature at a cost of only about £8 for the whole winter. With such a powerful heating apparatus, and the system carried out at the Free Trade Hall, there can be no excuse for inefficient warming of public buildings, nor for erecting new buildings without proper ventilation.—I am, &c.,

HENRY J. OSBORN.

Her Majesty's Theatre, in the Haymarket, is being cleaned and redecorated by Messrs. Campbell, Smith, and Co., of Newman-street, Oxford-street, W.

Intercommunication.

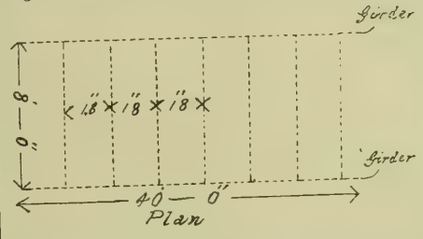
QUESTIONS.

[10156.]—**Yellow Cement.**—Can any of your readers let me know whether there is any cement that will when set resemble in colour the ordinary yellowish sandstone? and, if not, what is the best way of making an imitation stone to supply the place where some has been broken off? —R. A.

[10157.]—**Loads, Strains, &c.**—Will any fellow-reader of the "B.N." kindly advise me as to the best book practically to use in calculating loads, strains, &c., in iron structures such as roofs, girders, bridges, &c.? Is there any better than Cargill, Humber, Campin, Graham? —LINUS.

[10158.]—**Water Tower.**—Will one of the readers kindly tell me the best way of calculating the necessary thickness of the walls of a water tower? Also the weight and crushing weight of brickwork of different sorts? Also the best work treating on the strains on walls, &c.?—M. N.

[10159.]—**Safe Load of Floor per Foot Super.**—What is the computed safe load per foot super. that a floor will carry which is made of flat concrete arching mixed in the proportions of 5 parts of good aggregate to 1 of Portland cement?—cement-finished surface, total thickness 6in., 3½in. by 1½in. steel joists to be embedded in the concrete, 18in. centre to centre, these joists resting on girders 8ft. apart, thus—



I want the floor to carry 3½cwt. per foot sup. distributed load. Is the above safe? or what should be adopted to carry this load? Any information will be very acceptable, as I don't know of any reliable work treating of this subject—i.e., concrete arching.—A. H. W.

[10160.]—**Fireproof Floor.**—Will some reader kindly inform me what is the best kind of fireproof floor suitable for a warehouse to carry, say, from 2cwt. to 2½cwt. per square foot? Size of floor about 60ft. by 30ft. J. W. S.

[10161.]—**Approved Pattern.**—When glass for, say, screen and folding-doors across a passage is specified to be "flocked enamelled of approved pattern," can the proprietor demand, instead of the usual diaper or star patterns, panels and fanlights having centre pieces or figures, such as one sees embossed on front outdoors?—FAIRATION.

REPLIES.

[10116.]—**Copper Roofs.**—If "A. H." will put himself in communication with the undersigned, he will be happy to afford him some information in reference to the oxidation of copper.—ALF. MOORE, General Manager, Fredk. Braby and Co. (Limited), 352, Euston-road.

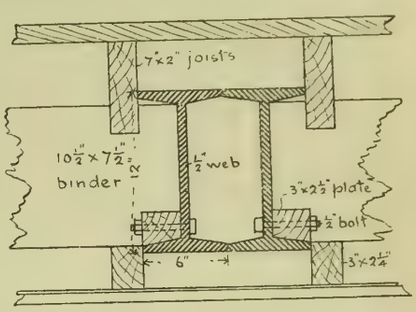
[10150.]—**Large Tracery Windows.**—In answer to "Tracery," I submit the following method, which I have found very useful in getting out moulds for church windows:—Set out on a drawing-board the left-hand half-elevation of window head from the springing line to a centre line; also set out plan of jambs and mullions both sides of centre line on springing line. From the centres now laid down it is easy to fill in the right-hand side of



window head, corresponding with the others on left-hand side, the mould might be tacked down until completed; doing it this way leaves the work to be done open to view, and, as a rule, the same mould applies to each side of centre line. The centre line would not, of course, interfere with moulds common to each side of centre.—R. LOWE.

[10152.]—**Sugar in Mortar.**—Sugar mixed with good lime mortar in the proportions of 1lb. of ordinary common sugar to a cubic foot of mortar, the sugar being mixed with the quantity of water applied in a liquid state will set quickly, and prevent the action of freezing.—J. F. PEDDIE.

[10148.]—**Beams, Floors, and Joists.**—(1) the beam supported in the centre with a column may be considered as two beams, each supported at one end and fixed at the other, and would therefore carry 1½ times the load than if supported only. Therefore, by removing the column the strength of the beam is reduced by one half by doubling the span, and also by one-fifth on account of the beam being supported only. This may be stated thus:—Half of the original load 11 tons= 5½ tons, deduct one-fifth of 5½ = 1 1-10 tons. Weight carried by beam after removal of column = 4 2-5 tons. (2) Area of floor carried by one binder = 10.0 × 6.6 = 65.0; therefore, weight of floor carried by one binder = 65 × 2½ = 162½ cwts. From the formula $W = \frac{C b d^2}{L}$ it is evident that $d^2 = \frac{W L}{C b}$. The strongest form of a beam is when the breadth is equal to $\frac{5}{7}$ depth. Substitute $\frac{5}{7} d$ for b in the formula. Then $d^2 = \frac{W L}{C \frac{5}{7} d}$, therefore $d^3 = \frac{W . L}{C . \frac{5}{7}}$, allowing the safe load as ¼, then $d^3 = \frac{4 W L}{C . \frac{5}{7}}$; therefore $d^3 = \frac{4 \times 162\frac{1}{2} \times 10}{8 \times \frac{5}{7}} = 1137\frac{1}{2}$; therefore $d = \sqrt[3]{1137\frac{1}{2}} = 10{\cdot}447$ or, say, 10½in., and $b = \frac{5}{7} d = \frac{5}{7}$ of 10½ = 7½. The binder should therefore be 10½in. × 7½in. (3) Each iron joist carries the ends of two binders, which is equal to the whole weight



on one. This by (2) = 162½ cwt. or 8⅛ tons. Take depth (d) = 1ft. or 1-20 span. Then, by the formula $a = \frac{W L}{40 d}$ $a = \frac{8\frac{1}{8} \times 20}{40 \times 1} = 4$ 1-16in., say, 4¼in. on account of depth being taken less than 1-15 span. Take flange of girder, 6in. wide, with an average thickness of ⅞in., as per sketch. —H. CARTER PEGG.

CHIPS.

At St. Bride's Church, Fleet-street, on Wednesday, a mural brass memorial to Samuel Richardson, the father of the modern novel, was unveiled by the Master and Wardens of the Stationers' Company. The tablet is affixed to the north wall of the church opposite to the family tomb of the novelist under the middle aisle, and was designed by Mr. J. G. Waller, F.S.A.

At a general meeting of the Institute of Painters in Oil Colours, held on Wednesday evening, Messrs. J. H. Lorimer, A.R.S.A., W. H. Bartlett, T. Hope M'Lachlan, A. Chevallier Tayler, and W. H. Pike were elected members.

A new Conservative club at Conway was opened last week. It has been built by Mr. Humphrey Lewis, from designs and plans by Mr. A. Foulkes and Mr. G. A. Humphreys, M.S.A., Llandudno.

The public library in the High-street at Kensington will be opened by Princess Louise to-day (Friday). The building is the old vestry hall, which has been repaired, altered, and reconstructed from plans by Mr. S. S. Bannister, of New-court, Lincoln's Inn. Mr. J. H. Hayden, of Bedford-gardens, Campden Hill, was the builder.

The sub-committee of the Town Council, which has charge of Kirkstall Abbey, have resolved to invite Mr. W. H. St. John Hope, F.S.A., to inspect the fabric of the abbey, and to report as to the best means of preserving it from decay.

A dedicatory service was held in the parish church of St. Andrew, Moretonhampstead, on Thursday evening, the 21st inst., on the completion of memorial and other windows. Three plain cathedral glass windows were inserted in the building some five or six years since on the south side and two on the north, and now six have been added. Two of the six are memorial windows, the centre one on the north side being of cathedral glass with coloured traceries and border. The other memorial window is the centre of the three on the south side, and is filled with stained glass. The four lights represent scenes from the life of Christ. The canopies above and bases below are in Perpendicular style. The tracery is filled with kneeling figures of angels, with canopies, scrolls, and texts. The work has been designed and executed by Mr. R. Driffield, of Beer and Driffield, Exeter.

The parish church of Almondsbury, near Bristol, is to be reseated throughout with carved oak benches. The contract has been let to Messrs. Jones and Willis, of Birmingham and London, who are carrying out the work from the designs of Mr. C. E. Ponting, architect. It is expecfed that the contract will be completed during December.

LEGAL INTELLIGENCE.

THE RIVAL RESTORERS AT ST. ALBAN'S.—JUDGMENT IN GIBBS V. GRIMTHORPE.—In the Consistory Court of St. Alban's, held by adjournment at the Royal Courts of Justice on Saturday, Mr. Chancellor Jeune, Q.C., delivered judgment in the matter of the petition presented by Mr. H. Hucks Gibbs for a faculty to restore, repair, and refit the great screen and to restore and refit the Lady-chapel of St. Alban's Cathedral. Lord Grimthorpe was the only opponent to the grant of such faculty. (See reports of the hearing of case in our last two issues, pp. 684 and 720.) The Chancellor, in giving judgment, went very fully into the history of the dispute, and quoted the original faculty granted to Sir E. Beckett by the late Dr. Robertson, then Chancellor of the Diocese, in May, 1880, adding:—I cannot come to any other conclusion than that it was intended to give powers to Lord Grimthorpe of repairing and restoring all or any part of the fabric of the cathedral just as they had been given to the committee. Similar powers also were, I think, given of refitting; but I understand refitting to refer to ornaments and furniture of the church, as to which nothing is in question now. I cannot regard the reservations of powers to the committee and their so-called resignation of them to the Bishop as giving to the Court power to issue out these powers to anyone else. The reservation of these powers was to the committee, and not to the Court; and I do not think that the Court was, or could be, made by the committee, even if they had tried to do so, which they did not, the heir of these powers. All the committee in law did was to dissolve their body and inform the Bishop they had done so. It is no doubt remarkable, and perhaps unprecedented, that a faculty in such ample terms should be granted to an individual to restore a church such as St. Alban's. But the circumstances, which are probably unprecedented also, explain and justify the nature of the grant. Certain it is that a faculty in no other terms would have been accepted by the opponent. And, after all, the powers vested in the opponent with regard to this cathedral are less (being only powers of restoration) than the powers vested for centuries in every dean and chapter with regard to every cathedral that has a dean and chapter, and those powers have on the whole been well and wisely exercised. I hope I may add, without offence to any cathedral body, that some deans and chapters probably do not possess, even collectively, the knowledge and experience of the opponent in church building and church restoration. Now, is such authority to repair and restore, in the ordinary sense of the words, bad on the face of it, so that the provision must be held void, or that endeavour must be made to place by construction a limit on the authority apparently conveyed by the words? It is argued that what is really to be done must be present to the mind of the Court when it grants the faculty—*i.e.*, that the Court cannot delegate its duty to the grantee of a faculty, and that therefore a grant of a faculty not specifying the details of the work, or at least all disputable parts of it, is invalid. It was argued that it was decided in "Clifton v. Ridsdale" (2 P.D. 350) that the grant of a faculty for an iron screen did not cover the erection of a crucifix on it apart from the question of the legality of the crucifix in itself; that in "Hughes v. Edwards" (2 P.D., 370) the Dean of the Arches was careful to order details of a proposed dado to be stated in a citation for a faculty; that in "Liddell v. Westerton" (Moore's Special Reports, 175) their Lordships referred to the laws forbidding alteration subsequent to consecration without a faculty as sufficient to prevent abuse with regard to the introduction of crosses into churches, and reference was made to the form of faculties in "Oughton" specifying with great particularity what was authorised to be done. It seems to me, however, that what is to be considered is the nature of the work proposed to be done in each instance. In the case of a new work there is no reason why very full details should not be stated and every disputable matter exhibited for the criticism of possible objectors, and if such details are not given no one can tell what the proposed erection will be like. But the cases of repairs and restoration are, from their nature, different. Repairs, indeed, need no faculty in the case of the rector (as was decided some years ago by the late Master of the Rolls in the case of Madresfield Church), and need not be executed with exactness if a faculty for doing them be given to anyone else. Restorations are to be distinguished both from repairs and from new work. It may be right in some cases in which the restoration involves much conjecture to indicate what is proposed to be done; but in cases where the features of the restoration are fairly obvious it would be needless to have plans and specifications. In other instances it might be impossible to decide beforehand what would be done, as no one till the fabric is pulled about can tell its defects. It seems to me, therefore, that in cases of restoration it must be a matter of discretion in each instance what, if any, plans, designs, or specifications should be required, and that a faculty is not bad or meaningless because it does not refer to any. Only, if it does not, then the authority to restore must be taken according to the fair meaning of the word, and be limited by such meaning. This view is supported by the case of "The Churchwardens of St. John, Margate" (1 Consistory, 198). Then comes the question: Can a faculty giving an authority to do work in a church be revoked or interfered with by a subsequent faculty? I do not think there is any direct authority on this point. I must therefore decide, as well as I can, on principle. Now, I think there is no doubt that a faculty for a pew, or probably a vault, cannot be revoked—i.e., as it has been put, it is good against the ordinary himself. That is established by the cases of "Grove v. Rector and Parishioners of Hornsey" (1 Consistory, 195), "Fuller v. Lane" (2 Add., 431), "Knapp v. the Parishioners of St. Mary, Willesden" (2 Robertson, 364); and I regard the case of "Butt v. Jones" (2 Haggard, 417), in which the faculty was held by Sir John Nicoll to have been "fraudulently and surreptitiously" obtained, as an exception which proves the rule. It is suggested that the reason for this is that a private and temporal right is conferred. I doubt, however, whether this is the reason, or at least the only reason. The principle that seems to me best to cover the whole ground is the simple one that these grants of faculties by decree of a competent Court are in the nature of judgments *in rem*, and that once finally and validly made they cannot be set aside or challenged in any subsequent proceeding in the same, or indeed in any Court. But, of course, it is necessary in each instance to see exactly what it is that the decree does order and the faculty does authorise. A faculty for a pew in its usual form authorises persons under certain conditions to use it for all time. A faculty for a monument is to erect it, by which certain legal rights are established, but it is not to keep it always in the same place. So a faculty to make alterations in a church does not decree that such alterations will never be themselves altered by a subsequent faculty; but it does in terms provide that the person authorised shall be at liberty to carry out what is authorised, and, therefore, that no subsequent faculty can be issued interfering with his so doing. Another ground for maintaining this conclusion may be that the subsequent faculty would be a derogation from the grant contained in the first, and, though faculties are really decrees of a Court and only analogous to ordinary grants, this appears to be a legal consequence fairly deducible from the analogy. It was indeed conceded by Sir Walter Phillimore that work once begun, and on which money had been spent, could not be interfered with by a subsequent faculty. But if work begun cannot be interfered with because the holder of the faculty has spent money on it, why should not this apply to the whole work authorised by a faculty which he has spent money to obtain in its terms? These considerations enable me to deal with this case. Taking, first, the Lady-chapel and presbytery, which it is a greed are part of the Cathedral, we find the opponent with a faculty which, in my opinion, validly gives him power to restore or repair it; and as I think on the evidence that before the petition he had done substantial work in the presbytery, he would even on this ground be entitled not to be interfered with. But I prefer to rest the matter on the terms of his faculty. It cannot be disputed that the faculty is in full force and observance as regards exercise of the powers conferred by it. I do not think, therefore, that this Court can issue any faculty interfering with the opponent's powers of restoring and repairing the Lady-chapel and presbytery, and a faculty to the petitioner in the same terms in regard to the same building, which is what he asks, would be a revocation of, or interference with, the opponent's faculty and powers. As regards the Lady-chapel and presbytery, I might stop here. But as there may be an appeal it is right to add that, even if I thought I had power to grant a faculty to the petitioner to restore and repair the Lady-chapel, I should not be prepared to do so. I fully recognise the taste and generosity of the petitioner as regards the admirable work done by him on the great screen, and I am not at all insensible to the wishes of the rector and churchwardens and of the members of the committee who support the petitioner's prayer. But these considerations are outweighed by the fact that the opponent came to the rescue of St. Alban's when the committee, the parish, the diocese, and the public were forced to abandon it in despair, and that he has exhibited, and is exhibiting, on the restoration of the cathedral a liberality which may, without exaggeration, be described as munificent, in a manner which in this suit is not challenged. He considers it essential, and he has never made any secret of his view, especially when applying for his faculty, that while he is restoring St. Alban's his decision on all matters connected with the restoration should be supreme. It may appear to persons without the responsibility of his position that he ought to be willing to accept a divided authority. But he is not; and I think he has earned the right to be allowed to carry out, uninterfered with, the scheme of restoration which he has for so many years been steadily and, considering the magnitude of the work, rapidly pursuing, and which has to some extent already extended, and may before long complete, extend, to the presbytery and Lady-chapel. The opponent asks for any additional faculty that may be needed. I do not think that any is needed now. If anything he desires to do in the Lady-chapel or presbytery should go beyond restoration and repair I can only say that an application for further powers by him would be entitled to the most attentive consideration, and I should hope would be unopposed. The case of the great screen stands on different grounds. So far as what the petitioner has done has consisted of repair and restoration, I regard him as having acted under the faculty of the opponent and as needing no confirmatory faculty. But has he not done more than repair and restoration? I have felt some difficulty about this part of the case because it is not easy to say, with regard to a structure like the great screen of St. Alban's, where restoration ends and new work begins. But I think it was practically the view of both parties, and on careful consideration it is mine, that the addition of the statues must be regarded as new work. There were, I presume, once statues in the niches, but they are lost, and no one can tell what they were like. They cannot be regarded as architectural decorations capable of being constructed by analogy of what remains elsewhere, or by reasonable conjecture. Their nature and detail might be, and by experience have been found to be, highly disputable. I think, therefore, that the petitioner is entitled to a faculty confirming all that he has done beyond repairs and restoration in regard to the great screen; and if he would apply for the inclusion of the further statues, which, we hear, have been ordered, I should suppose that no opposition would be made to that. There remains, however, the blank space in front of the screen. It appears to be the view of both parties, and it would certainly seem most probable, that a crucifix filled this space—I do not mean a scene of the Crucifixion, but an isolated crucifix. I need not express any opinion whether such a crucifix could legally be placed there: it is sufficient that the opponent (wisely, I think) says he will not so restore the space. It comes to this, therefore, that if this space is to be filled, something new, something which is not restoration, still less repair, must be done there. In my view, the opponent's faculty gives him no authority to do this, and there will be no interference with his faculty and no practical difficulty created by the power to place something new in that space being given to another person. Either the petitioner or opponent is at liberty to apply to place there whatever he thinks right. It is beyond my duty, and I should not presume, to suggest to either of the gentlemen what course they should take, but, seeing that they nearly once arrived at concurrence on the subject, I will say I should receive an application as to which they agreed with great satisfaction. I do not think this is a case for costs.—Sir Walter Phillimore asked whether it would be necessary to take out a fresh faculty for the unoccupied cruciform space.—The Chancellor said it would be better to take out a new faculty.

ARE ARCHITECTS EXPECTED TO KEEP BOOKS OF ACCOUNTS?—IN RE C. M. SHINER.—In this case of bankruptcy, which came before Mr. Registrar Linklater on Tuesday, the question arose as to the liability of persons practising as architects and surveyors to keep proper books of account. The bankrupt, Christopher M. Shiner, applied for an order of discharge, his liabilities being of small amount. The bankrupt began business as an architect and surveyor in 1881 with about £1,000 invested in mortgages and shares, and he attributed his failure to loss in connection with the purchase of the carcase of a house at Harrow, which he employed the petitioning creditor to complete; and to other causes. The Official Receiver reported that the bankrupt had been guilty of a statutory offence by omitting to keep such books of account as were usual and proper in his business and to sufficiently disclose his business transactions and financial position within the three years immediately preceding his bankruptcy. He stated that the bankrupt had produced an imperfectly-kept cash-book, which showed the accounts with some of his cash creditors, and also sundry subsidiary books, but he had not kept a proper ledger showing the accounts with his creditors, nor any accounts of his trade expenses or drawings for personal expenditure, and he admitted that his books had not been balanced. The petitioning creditor opposed on other grounds. Mr. Reed, for the bankrupt, submitted two questions—first, whether the profession of an architect and surveyor was a "trade or business" within the meaning of the section 28 of the Bankruptcy Act; and, secondly, what books were necessary to be kept in it? He cited "*Ex parte* the Board of Trade *re* Mutton," and referred to the bankrupt's evidence, which showed that his books, taken together, contained a record of the whole of his transactions. He submitted that it was difficult to say what books an architect ought to keep. Should he be required to keep bought and sold ledgers, day-books, and

ooks of that description? And what kind of edger could he keep?—Mr. Registrar Linklater, in iving judgment, remarked that a doubt had been xpressed whether an architect could be said to arry on a business. He did not know how that ras; it seemed to be a question of fact, and not of aw. He should have thought an architect did arry on a business, but there was no evidence on he subject one way or the other. Assuming, however, that the offence was proved, it appeared that he interests of creditors had practically not been ffected by the omission, and the discharge would e granted, subject to a nominal suspension of three veeks.

WATER SUPPLY AND SANITARY MATTERS.

The Vyrnwy Water Supply.—It was intended ast week to turn the water from the Vyrnwy lake nto the pipe line as far as Oswestry in order to fill he large reservoir there, which has now been completed, for the storage of the water before it passes hrough the series of filtering beds on its way to iverpool. This, however, has been prevented by he bursting of the pipes in two places, one above hat part of the aqueduct which lies over the entyr, near the village of Llanrhaiadr, and the ther on that section of the pipes running through ilwrch, Bodlith, and Penllan. The consequences f these mishaps were not serious, as the pipes only ontained surplus water, but alarm and apprehenon are being felt by the inhabitants of places on he line that when the water is turned into it from ake Vyrnwy the bursting of the pipes may lead to ischief.

CHIPS.

The ventilation of the new post office, Bury St. dmund's, has been carried out on Kershaw's ystem, the patent inlet and air diffuser being dopted for the supply of fresh air, and the patent neumatic ventilator for the removal of vitiated air.

The Pirbright Board School, Surrey, are warmed nd ventilated by means of Shorland's patent Manchester stoves, supplied by Mr. Shorland, of Manchester.

An inquiry was held at the Public Hall, Easingold, on Friday, by Colonel W. M. Ducat, R.E., ith reference to the application of the rural sanitary authority to borrow £1,000, for works of ater supply for the township. Mr. F. C. Fairbank, .E., explained the scheme of water supply.

St. Mary's Church, Bridgnorth, was reopened on riday, after undergoing restorations under the nds of Mr. Smith, contractor, Broseley. The nprovements include reseating, the former oldshioned pews being replaced with open benches. he floors of the aisles have been relaid with ooden blocks, while the side galleries have been ntirely removed. New gasfittings have been fixed, nd other works carried out.

At Brompton Cemetery on Tuesday General Sir Stephenson unveiled a memorial erected to the emory of over one thousand Guardsmen who lie ithin the walls of that burial place. Mr. Burke as designed and erected a plain cross of white icilian marble, which rises from the centre of the ot. The three marble steps upon which it rests ave an octagonal base of Cornish granite, upon ur corners of which are piled round shot, while in e centre of each of four sides are two bronze guns ossed over the muzzle of a cannon. The badges the three regiments are cut upon the risers of the arble steps, and beneath is an inscription. The cost s been £500.

St Columba's R.C. Church, Edinburgh, was blessed Sunday week. It accommodates 530 persons, d has been built from designs by Mr. Roderick meron, of George-street, Edinburgh.

In anticipation of the judgment to be pronounced Mr. Chancellor Jeune on Saturday, eight more atues were placed during last week in the niches the high altar-screen at St. Alban's, leaving only o empty spaces. All the statues, 74 in number, re the work of Mr. Harry Hems, and were ecuted to the commission of Mr. Hucks Gibbs. e illustrated some of the figures in our issues of v. 19, 1886, and June 28 of the present year.

A meeting of the St. Paul's Ecclesiological Society s held on Wednesday evening at St. Paul's apter-house, when Mr. Andrew Oliver, R.I.B.A., read a paper on "Flemish Brasses England," illustrated by numerous rubbings.

A new theatre has been erected at Bury, and cial attention has been paid to the ventilation, ich is carried out on the Boyle system, the latest proved form of the self-acting air-pump ventor being adopted for the extraction of the iated air.

A stained-glass memorial window has been placed the north wall of the parish church of Ellesmere rt. The subjects are Simeon and the prophetess nna, and Mr. William Haswell, of Chester, was artist.

Our Office Table.

Mr. Thomas A. Walker, of Westminster, the contractor for the Manchester Ship Canal, died at his residence, Mount Ballan, Sulbrook, near Chepstow, on Monday. His health had been failing seriously for some time, but his death was not so immediately expected. He had some time since made all necessary arrangements for the completion of his important contracts in the event of his death by his executors and staff of agents. Mr. Walker's two chief contracts now pending are the Ship Canal works and the harbour works at Buenos Ayres undertaken for the Argentine Government. Both of these works are well advanced, upwards of £2,000,000, out of an estimated sum of £5,750,000, having been expended on the works at Manchester, and about £1,500,000 at Buenos Ayres. Mr. Walker was a son of the late Mr. Walker, of Chillington, Staffs, for many years agent for the Chillington estates, and brother to the late Mr. R. H. Walker, of Brewood, who occupied the same position for a quarter of a century. Born in 1827 he began his active career before he reached the age of 17, and from 1847 to 1854 he was engaged on Mr. Brassey's staff on the North Staffordshire Railway. The next seven years were spent in Canada constructing railways, and he then spent some time in Egypt and Russia engaged in surveys and explorations. At the time of his death he had 30,000 men in his employ. Among the great public works in this country constructed by Mr. Walker, who has of recent years been the largest single-handed contractor in the kingdom, were the completion of the District and Metropolitan Railways, the East London Railway, the Severn Tunnel (concerning which he wrote an interesting volume), the Preston Docks, the Barry Docks and Railways in South Wales, and the Prince of Wales Docks at Cardiff. In these enterprises Mr. Walker was closely associated with the leading engineers of the day, notably Sir John Hawkshaw, Mr. Abernethy, Mr. Leader Williams, and Mr. J. W. Barry. Unostentatious and retiring, and even taciturn, a Plymouth Brother by conviction, he always took a warm interest in the welfare of the employés. Mr. Walker, who must have amassed great wealth, leaves a widow and four daughters.

The Rev. Edmund Venables, Precentor of Lincoln Cathedral, in commenting on the narrow escape from destruction by fire of Beverley Minster last week, remarks:—"The cause of the fire was the usual one—plumbers working on the roof, and carrying their fire-pans with them to that windy height. Such work must ever continue necessary, for leaden roofs will ever need repair. But it need never be dangerous. No fire need ever be taken to the roof. For the last twenty years the roofs of Lincoln Cathedral, which are of vast area, have been continually under repair; but our rule there has been, whenever a defect has appeared, to strip off the whole faulty sheet, recast it, and replace it. No fire is on any pretence allowed to be taken to the roof, nor—and this is most important—is any soldering allowed to patch up holes. This is the chief cause of danger. Soldering is profitable to plumbers, and therefore popular with them; but it must be sternly prohibited as fraught with peril to the building. The Lincoln plan is perhaps a costly one; but it is the only safe one, and it may turn out to be the cheapest in the end." Lord Grimthorpe, in a characteristically-discursive letter, abounding in personalities, suggests that a more excellent way is to adopt autogenous plumbing, with a stick of lead melted into the crack or joint with a gas flame. The bulk of architects and builders, he asserts, use and insist on it, and this being so, the following sentence, "All mine (? architects as well as builders) at St. Alban's, both ecclesiastical and civil, have done so," follows as a natural corollary and a matter of course.

The club which has just been established for the purpose of facilitating social intercourse between past and present students of the Royal Academy schools was inaugurated, under promising auspices, by the president, Sir Frederic Leighton, P.R.A., on Saturday evening. The premises of the club are at 10, Denman-street, Piccadilly Circus. Among the members are not only the younger students of the Academy schools, but many Academicians and Associates, including Sir John Millais, Sir John Gilbert, Mr. Alfred Waterhouse, F.R.I.B.A., Mr. P. H Calderon, Mr. Vicat Cole, Mr. Alma-Tadema, Mr. Marcus Stone, Mr. Briton Rivière, Mr. W. Q. Orchardson, Mr. W. W. Ouless, Mr. Luke Fildes, Mr. H. Thorneycroft, Mr. H. Herkomer, and Mr. Val Prinsep. There was a large gathering of the students and their friends on Saturday evening, the guests being received by Mr. Robert S. Lovell, the hon. secretary. In the course of the evening Sir Frederic Leighton formally declared the club to be open. In doing so he said he wished to remind them that he was one of the family which had gathered within the walls of the building. A social evening was passed, some of the members and their friends contributing to the entertainment, which took the form of a smoking concert.

The second smoking concert of the A.A. Lyric Club for this session was held at the Mona Hotel, Covent Garden, on Thursday evening, the 21st inst. There was a good attendance of members and friends, and an excellent informal entertainment was given, encores being repeatedly demanded. Songs were contributed by Messrs. W. E. Johnson, S. Perks, F. H. Collins, J. D. Butler, F. Christopher, Herbert White, H. Tanner, and F. T. White. These were pleasantly interspersed by a selection on the Fairy Bells by Mr. W. R. Martin, recitations by Mr. W. C. Martin, banjo songs by Mr. T. Rutter, and a musical sketch by Mr. S. Perks. At the close everyone joined in "Auld Lang Syne," and the proceedings terminated with "God Save the Queen."

The dinner of the Plumbers' Company at Fishmongers' Hall, London Bridge, on Tuesday evening, was attended by a large number of guests, including Mr. C. T. Ritchie and the Lord Mayor and Sheriffs of London. The Master, Mr. W. H. Bishop, presided, and in referring to the movement for the registration of plumbers, he said it was the only instance, on a large scale, in which the masters and the operatives had combined, in any trade, to advance technical education among its members. Mr. Ritchie responded for the toast of "The Houses of Parliament," and complained of the foul odours prevalent in the House of Commons. Sir Edward Clarke responded for "The Judges and Bar of England," proposed by Sir Algernon Borthwick, and Mr. Mundella harped on the need for the development of technical education in giving the toast, "Sanitary Science and Technical Education."

There is evidently a growing determination among builders and owners to dispense with open fires in private houses, and to substitute a good warming apparatus. In London especially the change is to be welcomed—it is the only thing that will ever banish our horrible fogs. Among the systems tried we have seen repeated testimony borne lately to Mr. John Grundy's simple but very effective apparatus. Mr. Grundy has long been known as a successful warmer of churches and public buildings; but if the English public once consents to relinquish its open fires, he and others are likely to find business increased a hundredfold. Any architect or builder interested can see the apparatus in action for himself in an ordinary private house at 30, Duncan-terrace, Islington.

MEETINGS FOR THE ENSUING WEEK.

Monday.—Royal Institute of British Architects. "A Travelling Student's Tour in Cyprus and Greece," by R. Elsey Smith. 8 p.m.
Royal Academy. "Chemistry," No. 6, by Prof. A. H. Church, M.A. 4 p.m.
Liverpool Architectural Society. "The Medical Aspects of Ventilation," by Damer Harrison, F.R.C.S.E. 7 p.m
Society of Arts. Clerks of Works Association. Paper by F. M. H. Jones. 8 p.m.

Tuesday.—Institution of Civil Engineers.
Manchester Architectural Association. "Dry Rot," by W. H. Bidlake, M.A., of Birmingham.
Glasgow Architectural Association. "Elgin Cathedral," by W. Connor.
Institution of Civil Engineers. Discussion on "Water Tube Steam Boilers." Paper on "Triple Expansion Engines at Owens College," by Prof. Osborne Reynolds, F.R.S. 8 p.m.

Wednesday.—Society of Arts. "Rabies, and its Prevention," by Dr. Armand Ruffer. 8 p.m.

Friday.—Bradford Historical Society. "Bradford in the latter part of the Seventeenth Century," by T. T. Empsall, President.

At a meeting of architectural students, held at Sunderland on Wednesday evening, it was resolved to form an association for the furtherance of the study of architecture.

Trade News.

WAGES MOVEMENTS.

THE PROPOSED SLATE SYNDICATE.—The negotiations by a sydicate for the purchase of a large number of the slate quarries in North Wales are approaching completion. The quarries belonging to the Lord Penrhyn, Mr. Assheton Smith, and the Welsh Slate Company at Festiniog will join in the combination, but will abide by a common price list. The trade is very brisk, especially at the Llanberis and Merionethshire quarries, but at Bethesda the output is still limited to five days, and the men are complaining of the low rate of wages they are allowed to make.

PENZANCE.—The carpenters of Penzance, who demanded 4s. per week advance in wages, have negotiated with the employers and accepted an advance of 2s. 6d. weekly from March 1st.

The parish church of Wingrave, Bucks, has been restored from plans by Mr. G. Vialls, of Ealing. Messrs. Webster and Cannon, of Aylesbury, were the contractors, and Mr. Newman was the subcontractor for masonry.

The Junior Constitutional Club has secured for its new premises a large plot in Piccadilly, with a frontage of 120ft., and a depth almost as great, and looking directly over the Green Park. Mr. Robert W. Edis has been retained as architect, and the drawings will soon be well in hand. There is to be, a correspondent informs us, a grand smoking-room, 98ft. in length, on the ground floor. Coffee-rooms and the library will occupy the second floor, and billiard-rooms be placed above, while bedrooms are to be provided for sixty members. The club is designed for 6,000 members.

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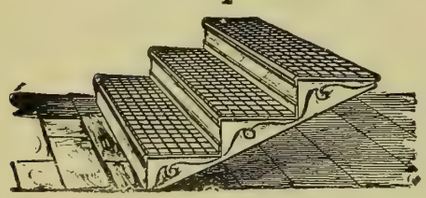
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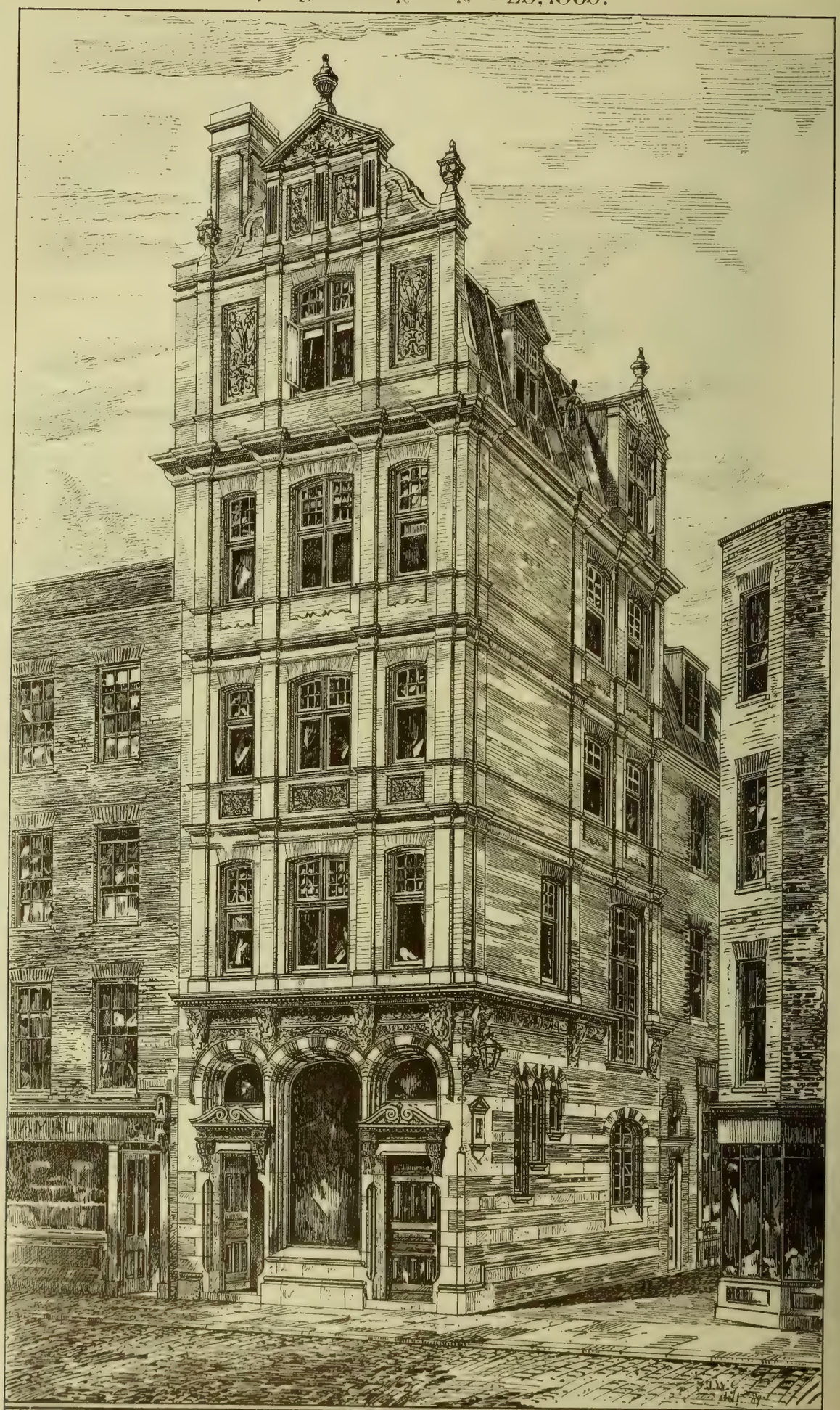
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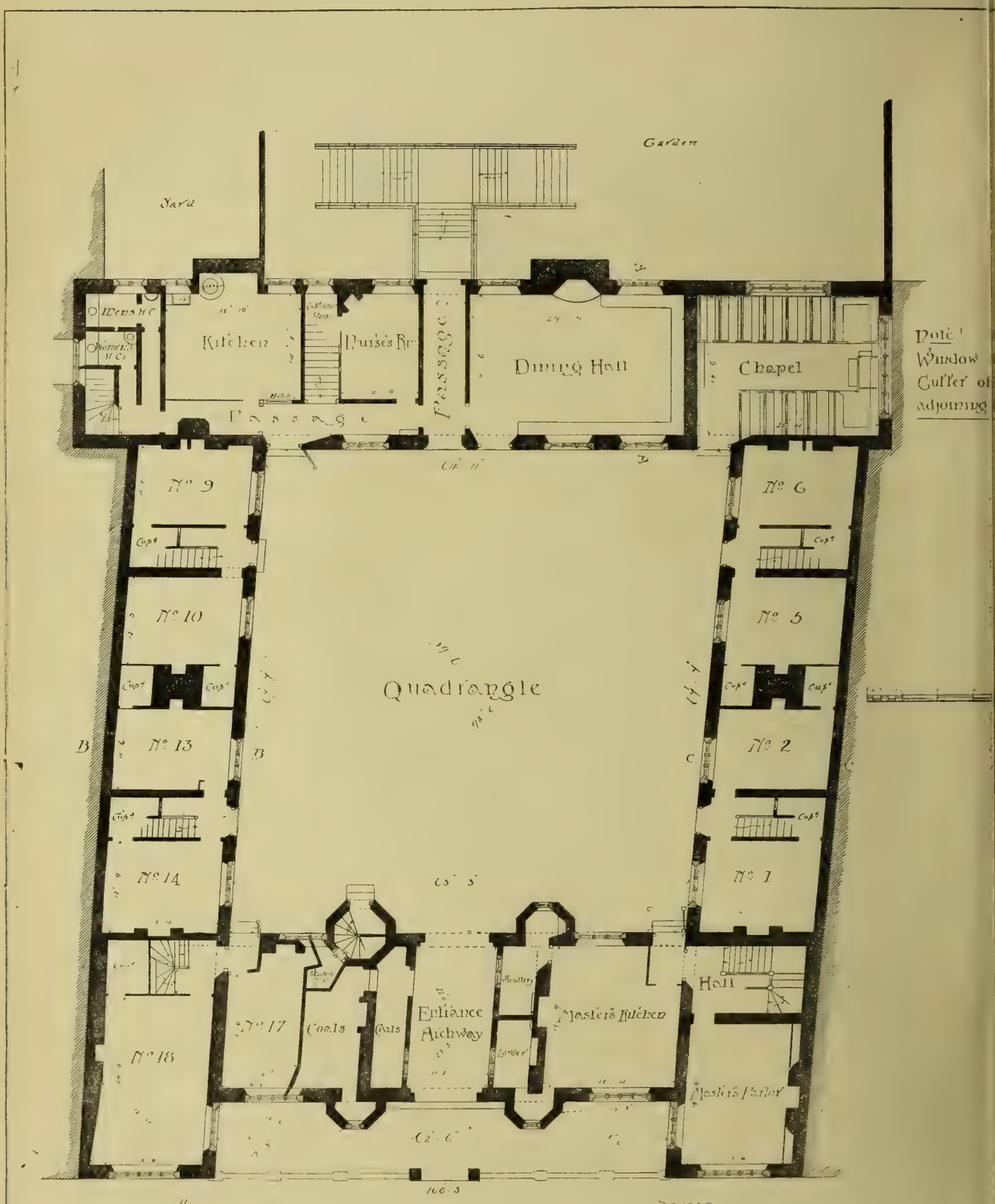
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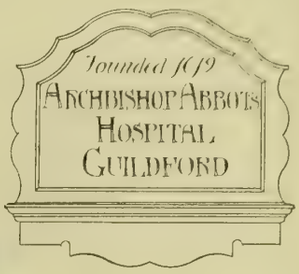
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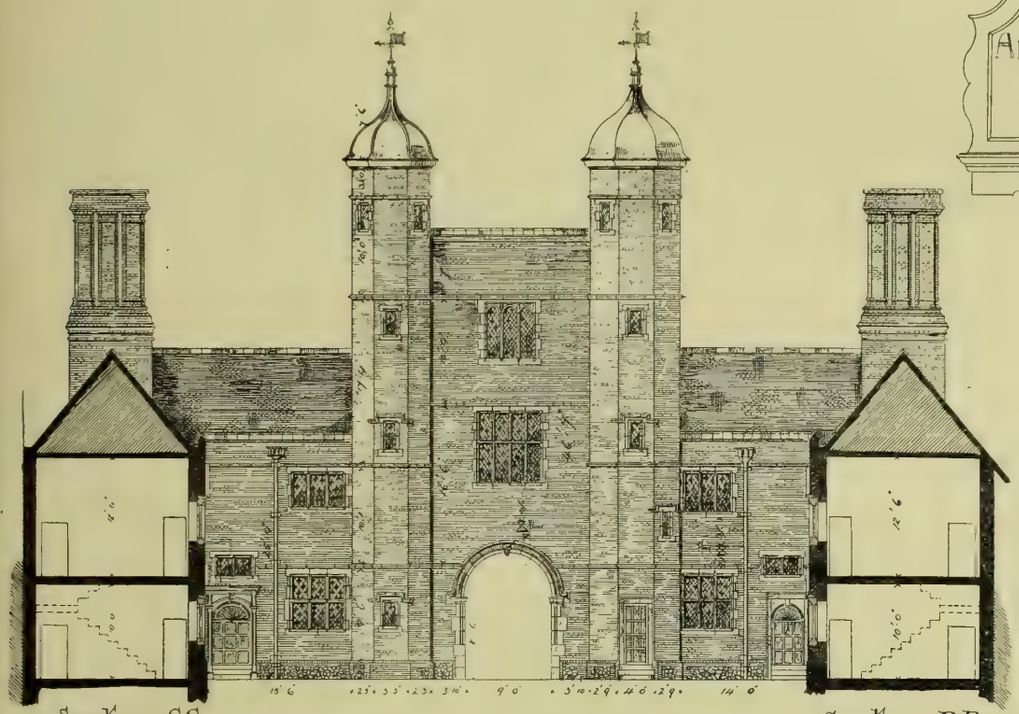


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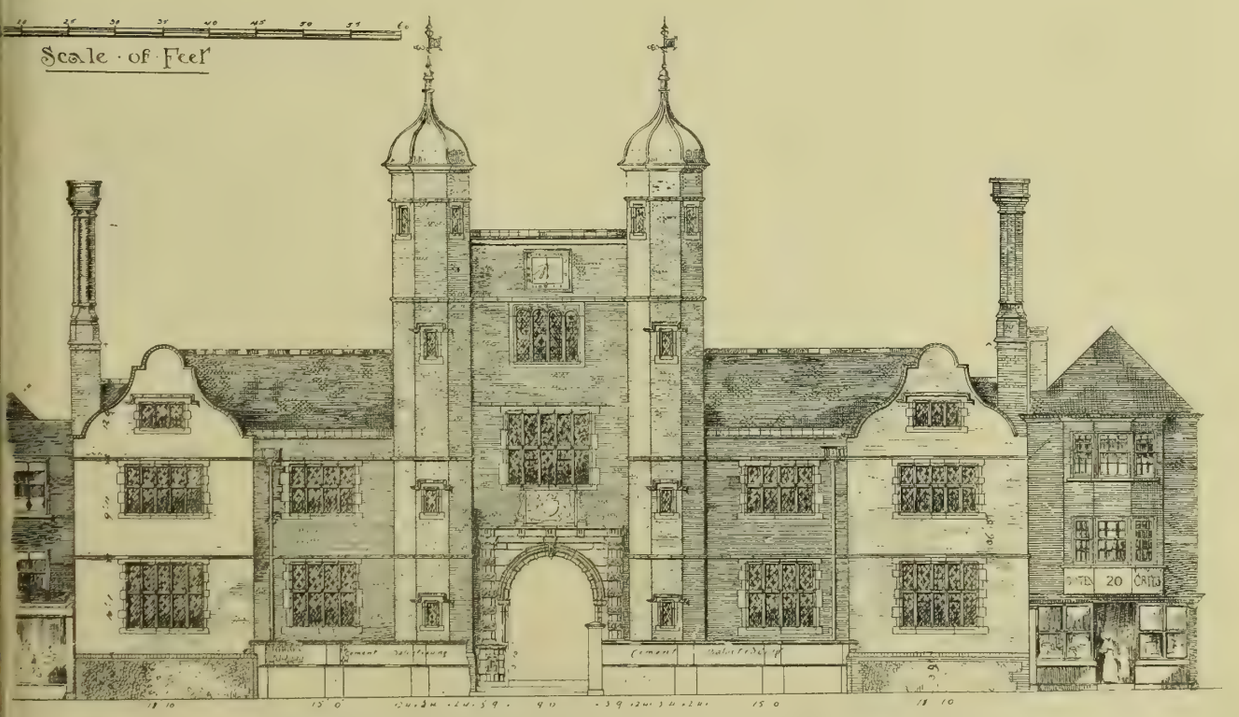


Section CC

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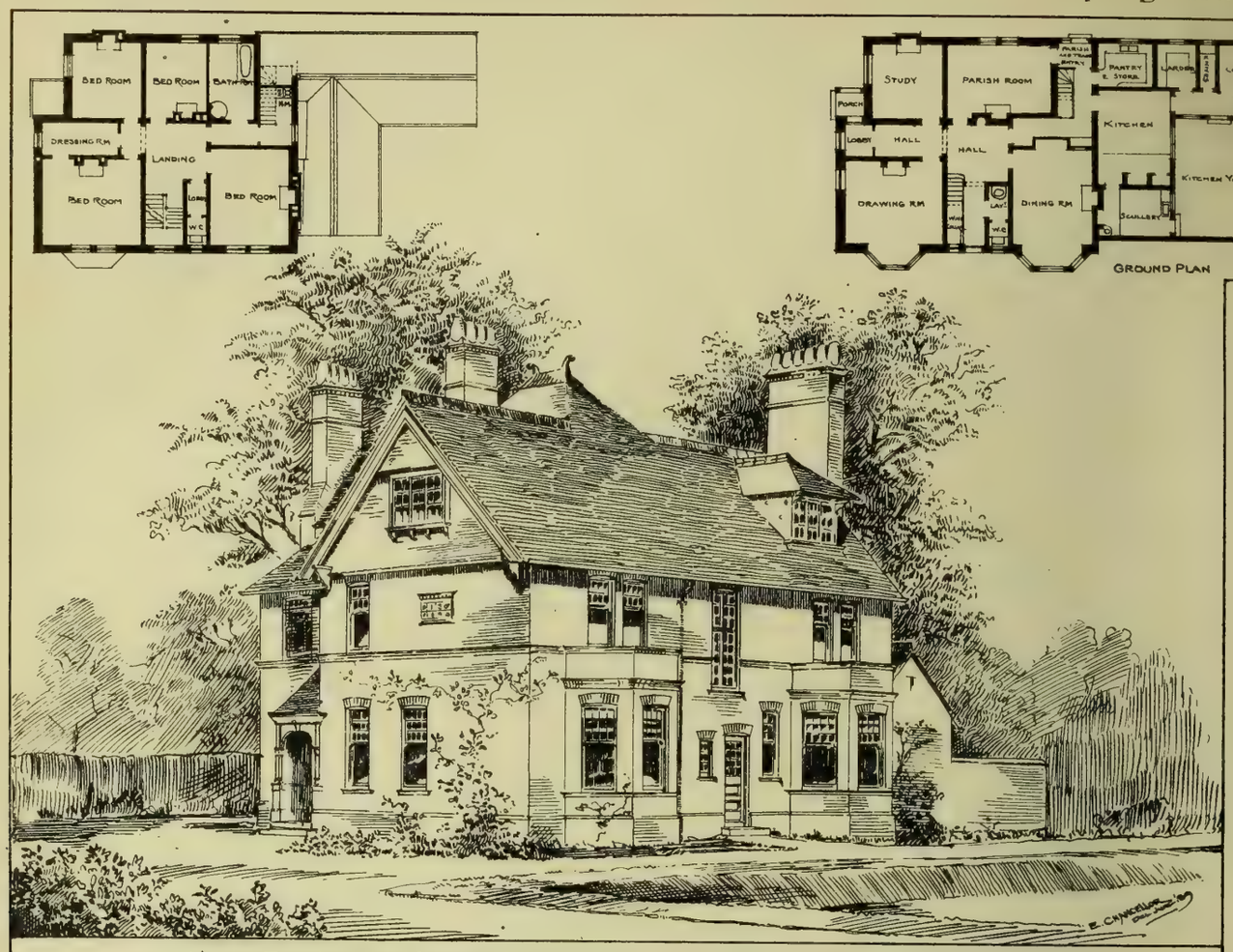
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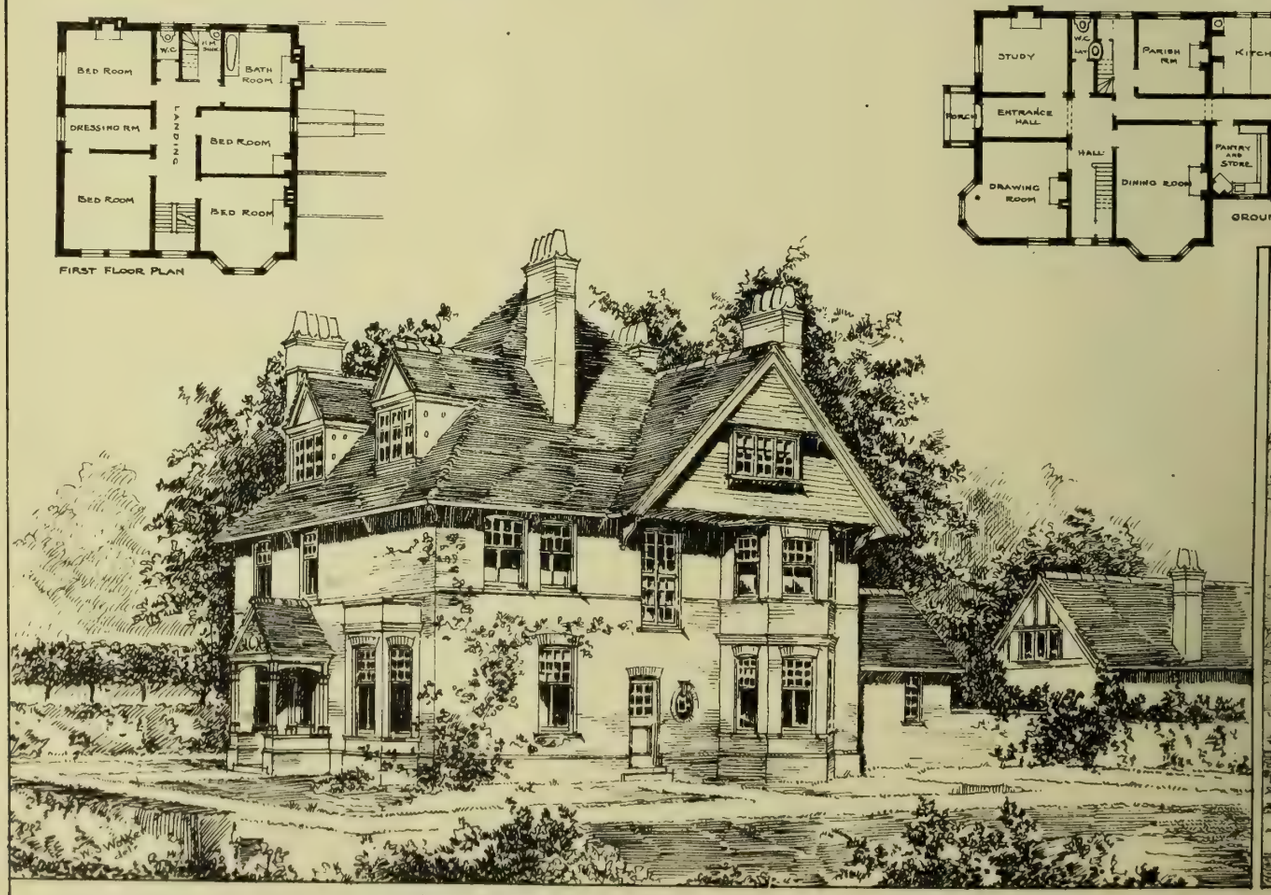


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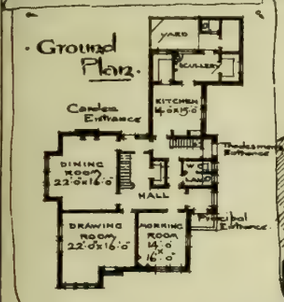


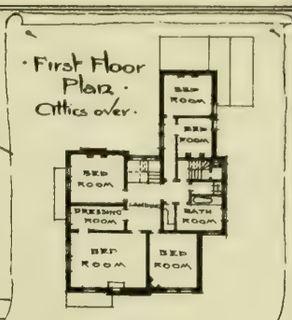
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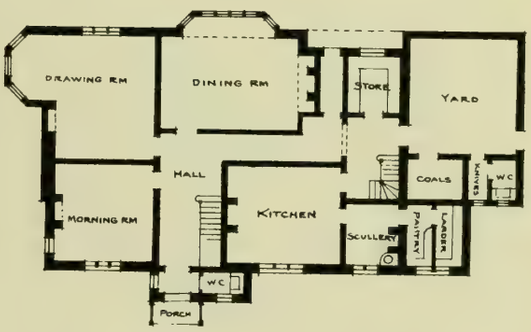


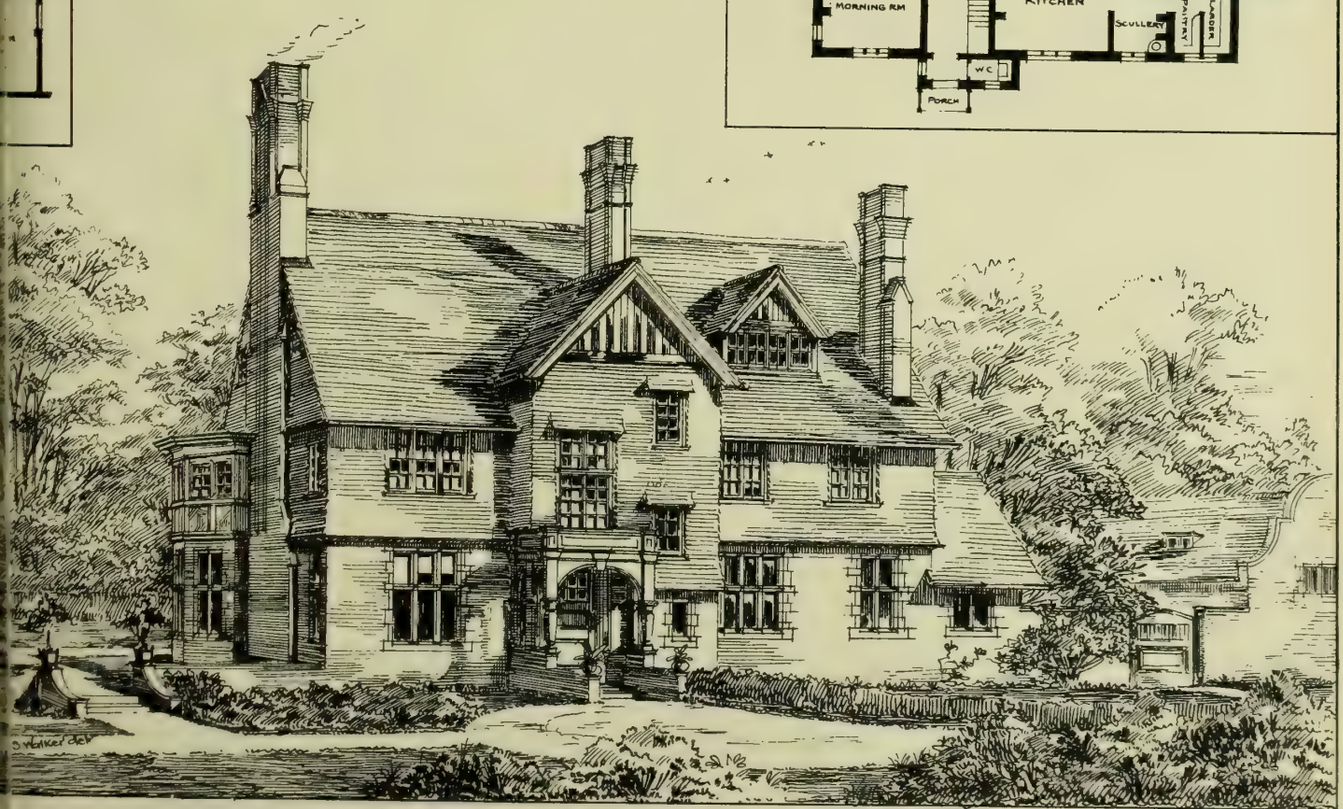




A Sheet of Four Residences

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Proposed Residence on the Upminster Hall Estate.

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COLOGNE - CATHEDRA



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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1822.
FRIDAY, DECEMBER 6, 1889.

DESIGN IN FITTINGS AND DECORATION.

RAPIDITY of execution, the cutting-down of estimates to meet circumstances, and other causes have seriously impaired anything like a thorough and congruous treatment of interiors. It is patent to everybody who has examined the internal fittings and decoration of our modern buildings that the architect has often been overruled in his attempts to introduce a superior class of workmanship. We need not look back at old fittings, joinery, and plasterwork to see that our designs are often crude, badly finished, and out of unison with the architecture. To go no farther than a house of moderate pretensions, where a great deal of display has been made outside, we find lobby partitions that do not unite with walls or ceilings, doors jammed up against return walls, architraves that do not stop the skirtings, staircases that have been squeezed up to admit a passage by them, cornices that are not returned round the walls, and other irregularities. The internal fittings of our places of business show the want of the architect's hand. They give one the impression that the architect had left the work when the carcase was complete, and that some fitter had undertaken to put up all the wooden partitions, counters, and gas-fittings, and finished the decorations throughout at a certain sum. What can be said of a large restaurant or buffet in which expensive mahogany glazed partitions are found that cut off the plaster cornices on one side, leaving the mouldings to run and stop dead against them?—or of a mahogany lobby, made to suit externally, but having nothing to agree with it internally — making awkward corners in the interior?—of ceiling beams carried on trusses on a framed mahogany partition on one side? A little excuse can be sometimes made for internal alterations to old buildings; but not even then when an architect has been engaged. These glaring faults stand out as shocking evidences of clumsy design and unskilful handiwork. The eye wanders over them at leisure moments; they are always intruding their ugliness and imperfection on the sensitive mind—a great deal more vividly because they are imperfect—while the faultlessness of the exterior design is perhaps seldom noticed. What is more obtrusively painful than bad or vulgar decoration? It is constantly troubling the spectator or irritating him with its weak and tawdry pattern and inharmonious colour. We put it down to the decorator; but a badly-shaped back or seat, which we cannot lean against or sit upon, or the base of a pilaster which is supported on a pair of trumpery wooden brackets, just high enough to crush a customer's hat when he attempts to rise, and to knock his head when standing, is more aggravating, because it offends our sense of fitness and convenience.

In matters of everyday use exact form and fitness will be demanded by everybody, perhaps with the signal exception of a drawing-room chair, into which art is supposed to enter in some form or other, either in making the back a curved or ring-like piece of wood, or the other extreme, an upright frame so straight as to make leaning disagreeable. In the same manner the assumption that there must be art fashion in architecture has hindered immensely its progress; plain common-sense requirements—as that a few inches will make all the difference between a comfortable width of door and a very inconvenient one; that a similar small addition of width may sometimes make a room, a passage, or a stairway convenient, are ignored as trivial or troublesome details in design. The want of nice calculation is observed when a wide mantelshelf is put into a narrow room, when two doors are hung so as to clash with one another, and recesses left for furniture that cannot be used. But nice planning and calculation of spaces is supposed to give way to so-called "art" in fittings and decoration. There must be some painted-glass subjects introduced here, an art mantelpiece there, and for these utility must give way. They appeal to a "fashionable taste," or to popular sympathy, more than good fittings arranged to suit the requirements and architecture. Stained-glass panels, stencilling, wall decoration, or ornamental tile work are valued more than the design of the joiner's work, and the idea is to exalt the labour of the accessory artist, and to make the architecture suit the latter. By taking this subsidiary view of the real architect's work, we cannot wonder that modern interior fittings are what they are; we cannot be surprised to find all good architecture and workmanship left at the front door, the interior being given over to the wholesale taste of the fitter, the upholsterer, and decorator. Each of these does what he can to advertise his own trade. If it is stained glass, so much more of it is introduced that it looks as if the woodwork had been designed purposely to show off as many panels and patterns as possible. If mosaic paving, it is made obtrusive by design or colour. Brass or metalwork, gas pendants and brackets often tire by their being made to thrust themselves on the attention of the visitor, a vulgarity we find in buffets and restaurants decorated according to modern fashion. This kind of "shouting," or "ranting," as it is termed, is largely on the increase, it is encouraged by self-advertising firms of manufacturers and decorators.

Let us turn for a moment to truthful art; how those who know what art is employ these accessory fittings. Take, for example, the house of any of our great painters—Mr. Alma-Tadema, for example. One peculiarity that has been noticed is that, unlike laboured Queen Anne houses, there is no one detail of its furniture or decoration that fastens on the mind. Everything — mantelpieces, chairs, ornaments — is worth examination. The *ensemble* gives an impression of rich colour. As Mrs. Haweis, in her description says, it is not "an 'Owen Jones,' or 'Cottier' house, though all the science of those accomplished decorators may have been utilised. It is not a 'Morrisey' house, though Morris papers are brought in whenever they are wanted." The individuality of its owner is manifest, and if one desires to see what it is like let him look at an Alma-Tadema picture of an interior, with its wealth of material and ornament, its Pompeian walls, tones of yellow and red, and refined ornament and figures. In every apartment, even to the grand pianoforte, the "ego" is felt throughout all the suggestions of Roman design and taste. Those who have ever seen the late Mr. W. Burges's House, will find colour, and very strong colour too, but so managed amidst a maze of legend and story of Mediæval design, that nowhere can we say that it is bizarre. Here satire, symbol, old tales and fairy stories of Mediæval Europe are made to subserve a decorative purpose and scheme of bright colour. In the dining-room Devonshire marbles line the walls, the points of colour and interest being given by goblets of quaint design, of rock crystal, gem-set knives, and flagons of pearl. The stone mantelshelf is carved with the alphabet quaintly introduced in foliage, the book-cases illustrate the trades of building and the arts. There is an entire absence of the manufacturing decorator and the "art furniture" of the shops, for every thing has been designed expressly for some object. We do not say that such an ideal interior will suit everyone; but we wish to point out how a great artist will introduce his ideas and tastes into his work by trusting to no one but himself in their design, so that a continuity of thought and feeling and a harmony of ornament and colour are found in every part of it, the interior receiving its fullest share of attention.

The want of technical finish is one of the saddest things to be met with. We may refer to the common method of interrupting mouldings instead of returning them; the habit of finishing a moulding like an architrave to a window upon a narrow window board barely wide enough to stop it; imperfect stops to moulded work necessitating all kinds of expedients to get over the difficulty. The same want of finish is noticed in paving, in mosaic floor borders which are interrupted on one side, leaving the pattern incomplete. When hand-wrought joinery and mouldings were the rule, these discrepancies in workmanship were unknown: the workman set himself to the task of inventing a mode of finishing the work, whatever it was, to please the eye. We never, for instance, saw two pieces of framed partition with differing heights of rails and panels, or the moulded capping of one stopped abruptly against a narrow stile. Mitres were carefully made. The skirting was stopped against bases or blocks instead of being cruelly "coaxed." There is one cause of all this—the specification of cheap fittings, whether in artistic wall-papers, mosaic pavements, "art furniture" and metal work. The architect for his own reputation ought to use his judgment and discretion in selecting from known firms the proper patterns, or in having his own designs carried out. These details and fittings are, on the contrary, left to the contractor. He often sublets portions of the work at unremunerative prices, over which the architect has little control. Instead of being bound to the original specification, the tradesman's terms are often easier, allowing the most flimsy workmanship. On the other hand, the system of sub-contracts, when properly managed, is one that the architect ought to promote. It encourages a better class of workmanship by bringing into notice men and artists of ability in their special pursuits, and who are more likely to satisfy the architect. These contracts may be reserved at the time of estimating, allowing the general contractors a percentage on them. One mode of doing this, and of avoiding the uncertainties and flagrant notes of decoration and colour to which we have referred, is to make special provision for fittings, and the finishing trades over which the architect should exercise a controlling power.

ARCHITECTURAL BRICKWORK.—XXIV.

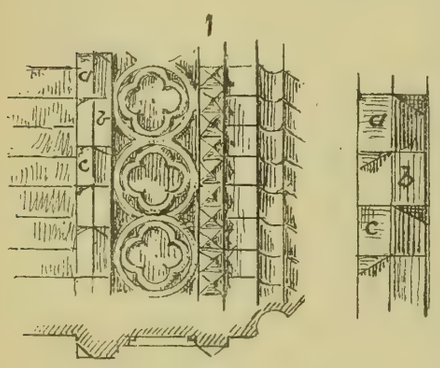
PIER AND MULLION BOND.

HAVING shown a few of the modes in which the bond of piers is worked, it may be useful to allude to the manner of forming the mullions of canted bay windows. A great deal must here be left to the skill and ingenuity of the bricksetter. Where a number of such windows have to be erected it is desirable to have specially moulded bricks to suit the angle of splay and the width and depth of mullion; but in many cases the bricks are cut to the splay. Figs. 6, 7, and 8 represent the splayed mullion of an ordinary bay window for a reveal of half a brick to the sash-frame. The shallow depth of the brickwork does not give much strength, which depends chiefly on the manner the bond is worked, the mortar, and the weight carried. The window pulley stiles are also a help and a guide to the work. In

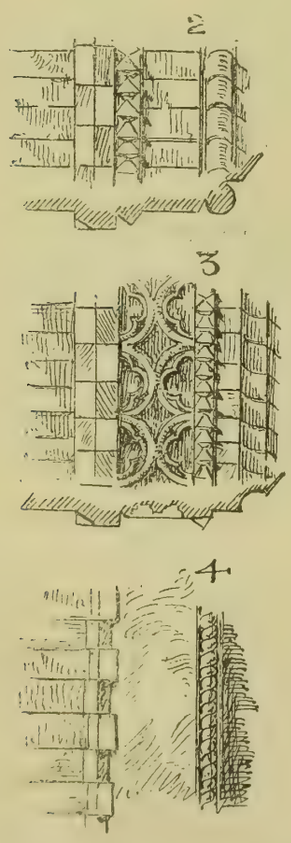
the first plan one course consists of half a brick, *a*, and two three-quarter bricks, *b c*, fitted to the size; the middle one which forms the angle *b* is cut to the angle and splay, and bevelled at the end, as shown. In the next course the bat, or half-brick, occupies the other end, the result of which is to give a lap of 2¼, as represented by the sketch of mullion 7. Sometimes, if the pier is wider, whole bricks are used instead of three-quarter bats, as represented on Plan 8. These plans show the smaller kind of splayed angle mullions; we shall give other larger mullions as we proceed.

ORNAMENTAL JAMBS AND ARCHITRAVES.

Hitherto we have been describing plain square reveals and jambs to the openings or



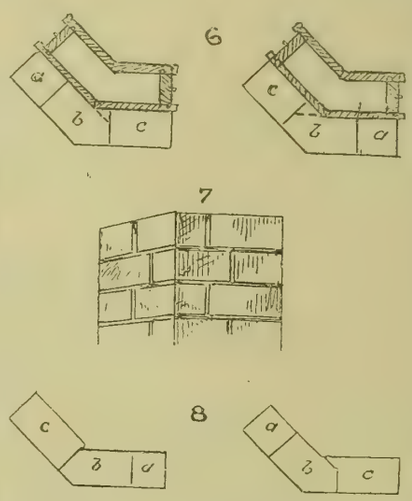
edges of piers. We now illustrate a few examples of ornamental brick jambs, common in Italy, to show how readily brickwork will lend itself to decoration. Those we give



sketches of are taken from the window jambs of the Church of the Frari, Venice. It will be noticed that the first and third sketches show a quatrefoiled circle ornament, forming a vertical band or architrave between brick members—a very usual form of decoration; sometimes the traceried ornament is of marble, but often it is of moulded brick, producing an extremely rich effect. The outside member shown in detail on the right, Fig. 1, is formed, as shown in the hatched sections, of a square brick splayed, the splays being alternately arranged in the courses. On the inside edge is a small kind of nail-head enrichment, and at the angle the bricks are hollowed and cut to the splay. Sketch 2 represents a plain brick jamb, with a torus edge moulding, and an outside member like the last, with alternate splays. The effect produced by the latter form of ornament, which is frequently met with, is enhanced by the strong sunlight, which throws one splay of each brick into shadow, producing a very piquant and decorative kind of member. In Fig. 4 we represent a portion of the architrave of an entrance to the same church, in which marble is introduced between the brick members, a cable moulding forming the angle of jamb, and the alternating prism enrichment the outside member. The Frari Church is rich in ornamental brickwork, the painted windows of the polygonal apse have moulded jambs and arches, with traceried heads and transoms, and there is some good intersecting tracery round the cornice of building.

MOULDED BRICK JAMBS.

It is a pity that architects do not avail themselves more of these means of decoration which are easily obtainable in brick.



The square and splay ornament or "prism" enrichment, which we have called it, is simple, and peculiarly suitable for outside architrave members, giving a sharp and very rich effect, as the light catches the alternate squares, and casts their shadow on the plain face of architrave. Again, the flat architrave enrichment can be formed of moulded bricks or squares, 6in. square or more, such as those manufactured by James Brown and other firms, and which we have previously described for panels and diapers. Set between moulded brick members, these make a good architrave, and an ornamental doorway in brickwork can be produced at much less cost than in stone. The moulded jamb bricks that are now manufactured for reveals of windows and doorways offer the architect a wide choice. To bond these jamb bricks, one brick is laid as a stretcher on the face of wall, the other as a header, the moulded edges being arranged one over the other. These bricks are made of the same size as common bricks, and can be arranged to bond with the work. Architrave mouldings on the face, made to project with ogee and other members, are frequently used, and when these are sharp, and the bricks of good hard quality, will last quite as long as stone architraves. We shall illustrate a few examples of moulded jamb bricks.

ROYAL SOCIETY OF PAINTERS IN WATER-COLOURS.

A FINE collection of water-colour drawings and sketches was opened to the public last Saturday at this society's gallery in 5A, Pall Mall East, made more interesting by the series of pencil and charcoal sketches and studies for pictures contributed by Mr. E. Burne-Jones; but we miss the works of Mr. Carl Haag, L. Alma-Tadema, and a few other well-known contributors to the home of English water-colours. Mr. Burne-Jones' sketches to some extent compensate for their absence, for although only studies, they are endowed with that charm of symbolism, subtlety, and spirituality of idea which have always lifted this painter's art out of the commonplace. His chief work is "Allegorical Statues in the Wall of the Garden of Idleness," suggested from Chaucer's "Romance of the Rose"—a series of figures in niches representing virtues and vices, archaic in drawing and colour, and illustrating a phase of Renaissance art—probably an early production of the painter. More characteristic of Mr. Burne-Jones's later style are the beautiful and delicately drawn studies of figures and heads. The figure reclining (219), the group (222) of two figures seated in converse, very graceful; and the pencil studies of heads (226) and figures (223 and 227) are exceedingly charming in drawing and expression. There are more than human lineaments in the combination of these almost angelic creations of the artist's pencil, and the graceful outlines and classic draperies are studies for the artist. Amongst them we see a study of figures for the now celebrated picture, "Golden Stairs." A design in gold and black and a stooping figure in red charcoal deserve attention. Miss Clara Montalba is well represented in the gallery by a dozen or more sketches—some, however, unfinished, such as "Stormy Weather, Venice." Many of these represent Dutch waters and coasts, as "A Calm, Dort" (103), "On the Maas" (112). A very luminous sketch is one of the ship *Anson* at Spithead (149) and the "Fleet Saluting" (1)—reminiscences of the last review. "The Façade of San Giorgio" (197), "West Cliff, Ramsgate" (250), also an impression of a crowd on the seashore, a charming bit of colour and drawing (272) are amongst them; probably the best is the sketch of "Blackfriars Bridge" (275), admirable in tone; the contrast of shadow and distant view of St. Paul's are rendered in the true pearly hues of the artist. "Fishing Boats, Venice," is a nice bit of grouping and colour (290). One of the cleverest and best-finished pictures is by Henry J. Henshall. "In Wonderland" is a study of a pretty girl, with a wealth of dark locks of dishevelled hair, leaning back in an armchair of antique design in a well-furnished library; the shelves of books form a dark background to the rich rose-coloured frock and the sheeny brightness of the dress and pillows. The young lady is entranced; she has in her hand a large book of pictures, and looks lost in imagination and wonder. Mr. Henshall has thrown a spell over his subject by the handling of lights and shadows, and the gloom of the surrounding accessories.

A large number of works are sent by S. P. Jackson, chiefly coast and bay studies in South Wales and Cornwall. These sketches are all sympathetic, full of careful handling. "Mewslade Bay, S. Wales" (230) is a fine sunset view of the bay. In landscape, Robert W. Allan, R.S.W., continues to attract as a master of massing light and shadow. "Château Amboise" (7) is solidly painted, the grouped buildings and river

picturesquely handled. His "French Peasants Arriving for the Vintage" (66)—the boats unloading their freight of labourers—is a masterly sketch, strong in touch and of exquisite colour. There is no finicalness here, but a decided effect produced by a few touches. "View at Pauillac, Medoc" (95). is also broad and decisive. In his series of Swiss mountains and lakes under varied effects of atmosphere and mist, William Collingwood is particularly strong. His "Sketches on the Riffel" (3), "Evening on the Combin" (80), "The Weisshorn and Matterhorn" (81), "The Tour de Marsens, Lake of Geneva" (97), "The Jungfrau" (193), give evidence of subtle mastery of cloudland and mist, sunlit peaks and sunlight penetrating grey clouds. Thus, in the Jungfrau, the peaks of the mountain reflect the sun's rays, the lower portions being bathed in grey mist in horizontal layers. The sunrise effect and the shadow reflection are well rendered. T. M. Richardson, in his two charming sketches, "Castle of Chillon, Lake of Geneva," and "Craigmiller Castle, near Edinburgh," points a contrast; the parallel is interesting. His fine landscape of "Ben Venu, Perthshire" (56), is cleverly handled in the foreground and blue mountain distance, the colouring pure. Other studies and sketches, as those on "Lago Maggiore" (138), and of Welsh scenery, show a keen sense of atmosphere, and the varied effects of shadow and sunlight in mountainous districts. We see fewer works than of yore by William Callow, and these are chiefly landscape. "Boppart on the Rhine" (74), and "Canal in Venice" (78), are characteristic of the sketchy drawing and transparent colour which we always find in Mr. Callow's studies; the last named is an avenue of palaces in deep shadow, handled with a true feeling of the power of colour. His fishing boats, "Hastings" (174), "Entrance Gate, Hurstmonceaux," "Boats in a Storm" (209), "Sketches on the Rhine, Beilstein" (249), "Old Houses at Frankfort" (261) are charmingly rendered. In some of these, as in 209, a dark, stormy sky with fishing boats, the artist has shown much force and depth of tone. In a very different vein of sentiment is the work of Mr. E. K. Johnson, bright and modern, "Oculis non Manibus" (77), a garden of luxuriant roses and flowers with admirers, takes us into another world rather artificial and fashionable. The colours and drawing are both exquisite; but there is a want of tone and gradation—too much of the genteel suburban villa. We remark Herbert M. Marshall's small sketches of Canterbury, Sonning, and Fowey (82), and Cuthbert Rigby's "Mountain Rill" (87), a masterly-handled work. Paul F. Naftel's studies of nature in her loveliest moods, especially the "Lutkill Valley, Derbyshire" (150), and the "Stream Alport" (208), and "Weeds" (108), are delightfully delicate, and the manipulation and colour as subtle as ever. H. Clarence Whaite is more laboured in his mountain sketch, "Pont Aberglaslyn, N. Wales" (110). Wilmot Pilsbury paints not only with finish, but with feeling. His "Cottage at Elstow" (76), the "Rippling Stream" (102), the charming drawing of Somersetshire cottages (119), with their white fronts and cheerful, trim gardens; "Wild Flowers and Shingle" (125), and other rural studies of wheatfields, are delightful transcripts, minute in detail yet feelingly drawn. Birket Foster, another honoured name amongst English landscape and rural subject painters, sends several studies. "Collier Unloading" (121), "Haytime" (132), the sketches at Balmacara, "A Misty Day, Ross-shire" (340), with its rocky loch, are characteristic sketches. The president, Sir John Gilbert, has two pictures, "The Sonnet," a wooded hillside or dell with horsemen, has a romantic sentiment about it, and the painter's freedom and solidity of handling are quite characteristic. The other study, "A Bishop," with mitre and pastoral staff, clad in chasuble and an acolyte in front, is a strongly-painted subject. G. H. Andrews, F.R.G.S., is a little too Turneresque in his colour. "Lincoln" (145), "The Parthenon and Acropolis" (156), "Entrance to Yarmouth Harbour" (317), are colour melodies a little too vivid for English eyes. Sir O. W. Brierly has two Venetian studies, "The Salute" (17) and "Fishing Boats Drying Nets" (30). We must notice also the bright transparent drawings of George A. Fripp, whose coast studies are among the attractions of the gallery. "The West Coast of the Island of Sark" (169) is one of these. The secretary, Mr. Alfred D. Fripp, has on the screen also a clear study of rock, "Stair Hall, Hanbury Down, and the White Nore from the Point at Lulworth" (301); the yellow and grey tints of the cliffs are nicely rendered. Strong and vigorous are David Murray's moor and heather subject (173). Other sketches of interest and merit are contributed by R. Thorne Waite, whose "Lock on the Kennet" (129), cattle and corn and hayfield studies, "Lancing Mill" (186), and "Padworth Mill" (313) are conscientious and poetised renderings. The latter, with its evening glow, cottages, and water, makes a pleasing picture. Albert Goodwin, drawings of the "Dance of Death Bridge, Lucerne" (21), his view of Eton from the river, sketches of Clovelly (231) and on the Rhine (326, 330) are painstaking and delicate delineations, but lacking in other qualities. Charles Robertson's chief work is a large view of the "Khan Asad Pasha, Damascus" (126), representing the arrival of a Persian caravan. The figures and interior are well drawn, a tea-chest with rare china occupies the foreground of the interior, depicted with much truth of detail. Sketches of Canterbury and Dover are among other subjects. Henry Wallis is also a contributor of an Eastern theme. "The Sick King in Bokhara," taken from one of Matthew Arnold's poems, the subject of which appears to be quite subsidiary to the architecture. A few clever sketches from Verona are shown by Samuel J. Hodson (24, 88, 135). Seascape is represented by Henry Moore, A.R.A., in a fresh bit of rough sea (41), and one or two other sketches of coast. "Lloyd's News," by H. Stacey Marks, R.A. (53)—an old man in smock reading, a cockatoo (297), "Paradise Lane" (306), are studies displaying invention and nice colour. Ernest A. Waterlow, Thomas J. Watson (207), F. Smallfield (253), W. Eyre Walker (258), Matthew Hall (268), are among other painters whose works are of interest; and we must notice the extremely clever and characteristic sketches and studies of horses, oxen, and landscapes, by the late Frederick Tayler (233—247). The sketches by Walter Crane, for pictures, are interesting compositions. On the screens we notice some charming little studies by Mrs. Allingham, whose pencil and sense of colour are welcome additions. A clever figure group, "Factory Girls at the Old Clothes Fair" (321) shows some excellent drawing. Miss Naftel has a delightful study of roses in a tumbler, with fallen petals. As a refined study of figure composition and colour, we must also mention G. Lawrence Bulleid's "A Suppliant"—a Greek maiden before a statue and altar of Venus. The head of girl is charmingly drawn, modesty and devotion tenderly expressed, the background of translucent marble being most delicately rendered. Humour and careful workmanship are found in H. G. Glindoni's interior, an old gentleman at breakfast in morning attire of the last century, who tells his maid-servant, "Say I'm not at Home" (266). Though there are several absentees, the walls and screens make a creditable display.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE third ordinary meeting of the present session of this Institute was held on Monday evening, the President, Mr. Alfred Waterhouse, R.A., in the chair. It was announced that at the examinations last week forty candidates presented themselves, of whom twenty-eight satisfied the examiners. For the preliminary examinations held in various parts of the country there came forward 107 candidates, of whom 44 were declared exempt; the remaining 63 had satisfied the examiners, and had been registered as probationers; of these, 36 were examined in London, 8 in Bristol, 16 in Manchester, and 3 in Dublin.

A TOUR IN GREECE AND CYPRUS.

A paper was read by Mr. Ravenscroft Elsey Smith (son of Professor Roger Smith), who was elected in 1887 to a studentship at the British School of Archæology at Athens, subscribed for by the Institute and the late Mr. E. I'Anson, then President. The lecture described the author's examinations of the recent excavations of the Acropolis at Athens, his visit to Epidauros and Mycenæ, and the part he took in the excavations of the site of the Temple of Aphrodite at Paphos in Cyprus. The paper was illustrated by numerous plans and diagrams, and by photographs taken by the author, many of which were projected on to a large screen by the oxyhydrogen light, the slides being made and shown by Mr. W. Brooks. In Athens, Mr. Elsey Smith remarked, great attention has been attracted to the Acropolis by the thorough and very successful examination of its upper surface, now just brought to a conclusion, revealing, in addition to a vast number of fragments of sculpture, pottery, bronzes, &c., part of the foundations of the palace of Erechtheus and the old way up from the postern gate on the north side, and on the south foundation walls, supposed to belong to the Chalkotheke, near which were found a complete set of bronze mason's tools. The author said no architects had done so much for the elucidation of Athenian architecture as Mr. F. C. Penrose, at that time the director of the British School at Athens, and Dr. Dörpfeld. An account was next given of the Propylæa, based on Dr. Dörpfeld's theory that the design of the building was never completed, and that even the portion which remains was not brought to a finished state so far as the dressing of the surfaces is concerned; the interruption was probably caused by the outbreak of the Peloponnesian War. A plan and elevation of what is conjectured to be the complete design were displayed. The next building referred to was the Theatre of Dionysos, at Athens, the first prominent stone building of its class constructed in Greece. Here some remains of an early circular orchestra, constructed of polygonal masonry, and the foundations of the original Greek scenes of two distinct dates, have been uncovered. From the levels of the work recovered it seems evident that here, as at Epidauros and Oropos, there was originally no raised stage, and that the circle of the orchestra was complete. The extent and character of the Roman alterations, both to stage and orchestra, were referred to. A somewhat new form of Choragic monument, which was discovered last spring in the course of excavations carried on by the American Archæological School, was described. This consisted of a semicircular stone building, with pilasters at the ends, carrying a large inscribed lintel, the whole being roofed with a thin slab of stone. The lecturer next referred to recent excavations in the Peloponnesus at Epidauros and Mycenæ. At Epidauros the Tholos, with its foundations of six concentric rings of masonry, and the curious mazelike corridors formed between the four inner rings, were described; the details of the superstructure were also referred to, especially the very graceful Corinthian order of the interior. The theatre showed very clearly and perfectly the arrangement of the Greek orchestra and the sill of the scene, which in this case was found complete. The plan of the great palace which occupied the summit of the fortress at Mycenæ was described, as well as the plan of a smaller house found lower down the slope of the hill. The palace, though not so complete as the one at Tiryns, followed out the same general plan very closely, and must have corresponded with it in size very nearly, if it did not, indeed, exceed it. The third portion of the lecture was devoted to the work of the Cyprus

Exploration Fund, carried out by the director and students of the British Archæological School at Athens. The Crusading fortress of Leondari, on the site of a very much earlier settlement and fort, was referred to; but attention was chiefly directed to the work carried on in excavating on the site of the ancient temple of Aphrodite at Palæo-Paphos. The site of the modern village and of the temple was described, and Roman coins showing the temple were referred to; the fact of the absolute destruction of the entire superstructure and the practical clearance from the site of its materials, apparently in remote times, made, it was observed, the restoration of elevations or sections that should have any real value as correct impossible; but with the plan it was different, for that had to a considerable extent been recovered. It had been greatly modified from time to time, and was curiously irregular throughout. It consisted of buildings on three sides of a court, only a wall being traceable on the east side. On the north and south of the court were stoæ, the northern being the rougher of the two, while the southern stoa was divided by a range of columns. Against the latter stoa, on the inner side, was the central temple, while the west side of the court was occupied by other chambers. Three distinct types of early walling, besides extensive Roman additions and repairs, were identified; two of these occur in a wing projecting to the south, while the main body of the plan belongs to the third epoch, but was considerably modified in Roman times. The possible or probable uses of the various parts were discussed, and the almost total absence of any mouldings or architectural details of an earlier period than Roman was deplored. The very inconsiderable depth of earth and *débris* which covered the site, and which must have made it an easy prey to the spoiler in the past, was suggested as a cause for the absolute destruction which has occurred. Finally, a brief *résumé* of some of the principal objects found was given, and discussion on the somewhat complicated and difficult plan was invited.

Mr. F. C. Penrose, in proposing a vote of thanks to Mr. Elsey Smith for his paper, observed that there were several points about the plan and fragments of the Temple of Aphrodite at Paphos which reminded us of Solomon's Temple, so far as we could follow the very vague descriptions of that building which had come down to us. Although the excavations at Paphos had not brought to light many beautiful remains or much of the building, they had revealed the plan, parts of which had still, however, to be made out. As to the Acropolis at Athens, he shared the regret of Mr. Elsey Smith that all the Mediæval works, and especially the picturesque Turkish tower, had been removed. The demolition had not been justified by the finding of any remains beneath the walls, all the discoveries having been made between the walls and the Parthenon. At Epidauros the Tholos and theatre were of surpassing beauty, and another theatre of the same class had been examined at Oropos, north of Athens, where the remains were quite as well preserved as at Epidauros. When the discoveries at the palaces at Tiryns and Mycenæ were first announced by Dr. Schliemann, the speaker felt doubt whether these remains were so ancient as was supposed; but on a second and closer examination of the remains at Tiryns, he was convinced that the work in the partition walls he thought to be more recent, because so wretchedly constructed, was so bonded into the admittedly early building that he now quite confirmed the opinion of Dr. Schliemann as to its age, and this was further corroborated by the discoveries made at Mycenæ.

Mr. E. J. Tarver seconded the vote of thanks, and Mr. R. Phene Spiers asked for some further information as to the Temple of Eleusis, a plan of which was hung on a screen.

In reply, Mr. Elsey Smith said he only spent a day at Eleusis, and found there the remains of four temples of different periods on the same site, the second and largest one being of the best period. Dr. Dörpfeld had shown that the arrangement of the outer and inner propyleæ, the sacred processional path, and the temple, which were very clear, explained what must have been the arrangement in other temples of the same class and period. At Mycenæ part of the site of the palace was covered by the remains of a much later temple, which, from its style, could not be placed at a more recent date than the 6th century B.C., thus establishing the extreme antiquity of the palace itself.

ARCHITECTURAL ASSOCIATION.

THE third ordinary meeting of the Association was held on Friday evening, the President, Mr. Leonard Stokes, in the chair. Messrs. J. C. Stockdale, J. H. Wilson, and G. G. Milne were elected as members.

THE COLOUR DECORATION OF CHURCHES.

The following paper on this subject was read by Mr. E. Pridham Warren. It was illustrated by numerous sketches and cartoons, some of which are reproduced in our lithographic pages. If, the author observed, the interior of any public building is at least of equal importance to its exterior, the internal aspect of churches is of the first and highest importance, and the study of the decorative possibilities of and the special methods applicable to them is a study which the church architect cannot afford to neglect. While decorative art, as applied to civil and domestic buildings, has made enormous advances during the past few years, while old methods have been revived and amplified, and new methods have been devised and perfected, it is a question whether a corresponding and equally general advance has been made in the decoration of our churches. The average homes of educated people, nowadays, show an earnest, though often unsuccessful, attempt at decorative beauty, a preference for soft, warm tones and subdued effects. Is this true of our churches, for the decoration and embellishment of which precisely the same classes are responsible? Is it not rather the case that the average English church interior is one of cold formality, relieved too often by harsh spots of colour—unconsidered, inharmonious, the cruel, kaleidoscopic glare of bad stained glass, the vivid crudity of upholstery, the hard outlines and harder tones of stencilled ornaments, or the prevalent treacly nastiness of varnished pitch-pine? There is an effect of barrenness, of ready-made cheapness, of ecclesiastical triviality about the fittings and furniture. Cheap ready-made pulpits, candlesticks, and crosses, culled by well-meaning but uninstructed people from the illustrated lists of church furnishers or from the "ecclesiastical department" of the co-operative stores. It is chiefly, however, of colour, and the want of it, that I have to speak; for in those churches, numerous already, and daily increasing in number, where the greatest skill and care have been spent upon the fabric and its more immediate necessities, where the mind of an artist has impressed itself upon stone or marble, metal or wood, there is usually a partial, more usually an entire, absence of colour decoration—beauty of form without beauty of colour; and even in those rare cases, happily becoming less rare, where the windows are filled with mellow, soft-toned glass, they are generally isolated patches of colouring amidst the cold, low tones of the stonework and bare plastered walls; they stand out in too vivid contrast to their surroundings, like jewels set in ivory, whereas it may almost be accepted as a rule that in old churches, which contain remains of fine glass, you will also find traces of painting on walls and roofs. The windows were but a portion of the decorative scheme—an extension of the general adornment to a translucent surface. It is not generally realised to what an extent the interiors of our English churches were adorned with painting and gilding. Not only were the walls and roofs, whether of stone or timber, profusely and richly decorated; but the piers and arches, the carved enrichments of capitals and mouldings, the shrines and monuments of stone, the oak screens, pulpits and lecterns, the fonts and their spire-like covers, the stalls and doors, and even the mullions and tracery of the windows bore their share in the general adornment. There are few of us who would willingly accept bare stone or plastered walls in our own homes. We demand something finer, warmer in effect, more joyous in colour. Yet in our churches we submit with easy resignation to an absence of decoration we could not tolerate at home. This is, to a great extent, the fault of architects, many of whom seem to ignore colour decoration other than constructive colouring—the use of coloured stones, bricks, marble, tiles, and glass mosaic; or, when they employ decorative painting, do so in a timid and partial manner, which is ineffective. There are several notable exceptions to this rule, artists who have made a profound study of colour effects, and who thoroughly sympathise with the Mediæval craving for colour, the sense of incompleteness without it. Still, there is not enough leaven to leaven the whole lump, and it is the exception, not the rule, to find a church which presents anything like a consistent scheme of decoration. I do not wish to underrate constructive colouring—far from it; but I would first of all deal with those simpler and less costly methods which are more generally applicable, and which, in the unfortunately usual inadequacy of funds, often present the only decorative possibilities. There is a very general impression amongst clergy and laity alike that polychromatic decoration is always a very expensive matter. That it is often so I do not deny; but that decoration of a quiet, restrained, and dignified order is necessarily costly is an entirely wrong impression. The first step towards the revival of a lost art is the study of the works it has bequeathed to us, and it must be my task now to interest you in some of the methods of that decorative art which flourished in the latter half of the 14th and first half of the 15th century all over north-western Europe, and particularly in England. I have chosen that period, not because I ignore the many beautiful instances of the work of preceding centuries which remain to us, but because it seems the period most full of instances worthy of study, and, to some extent, of imitation, to-day. I propose to confine myself to the consideration of such methods as are applicable to the average English church; and disclaim any intention of dealing with pictorial frescoes, except incidentally, for pictorial decoration demands the highest skill, and, extremely desirable though I deem it to be, its application is necessarily costly, and, therefore, unfortunately practicable only in exceptional cases. Broadly speaking, the average English church is a Gothic building, either ancient or modern; and I propose, therefore, to speak mainly of the treatment of Gothic interiors, and to begin by describing some of the typical methods of the period referred to. Though much—alas! most—of the decorative beauties of our old churches have disappeared before the ravages of time, wilful or ignorant neglect, and wanton destruction, enough survives Puritan whitewash and the misguided zeal of the restorer to show what has existed, and to suggest what may yet be accomplished. The internal faces of the walls of English churches were usually coated with plaster, though in large and important churches, or where fine stone for ashlaring was obtainable, that material was left uncovered. When plaster was used it was regarded as a vehicle for painting, and the usual method of treating it was as follows:—A ground tint was washed over the whole surface to be decorated, and upon this all manner of patterns and devices were painted, frequently in one, and not often in more than three colours, though gilding was sometimes introduced as an enrichment. The pigment was generally, if not always, what is known as "distemper," the colours being vegetable earths, ground fine, and mixed with size or glue in water. The ground tint was very often a toned, or, as modern house-painters call it, a "broken" white; but sometimes a soft shade of red, blue, green, or yellow; the pattern tints being upon white grounds, generally red, green, black, or dark grey, and upon coloured grounds, either a dark tone of the ground-tint, or black or grey. A common type of decorative design was what we know as diaper pattern—that is to say, patterns which suggest, or were suggested by, the designs of figured diapers or stuffs, just as our modern paper-hangings suggest in name, and to some extent in design, the actual hangings of silk or damask from which they are derived. These diapers vary greatly in richness and complexity of design, but are generally flat and simple in colouring. The designs are sometimes distinctly Oriental in type, and seem to indicate that Eastern draperies, or their imitations, were used as hangings in Northern churches. Sometimes the designs are merely geometrical, at others a combination of geometrical figures and freely-drawn flowers, foliations, and even figures of birds and animals. They are often precisely similar in character to the tapestry backgrounds and enriched draperies of our contemporary pictures. This class of design may be freely studied in our National Gallery, and the student will be greatly assisted by consulting Mr. Vacher's most painstaking and excellent book, the illustrations of which are taken from pictures in that gallery. Roughly speaking, these diapers may be divided into two classes—"close diapers," in which the ground is almost covered by a closely-interwoven continuous pattern, and "sparse diapers," in which conventionalised sprigs and flowers are sprinkled

at regular intervals over the ground so as to form a pattern. Akin to the method of sparse diapering is that of sprinkling, or, as it is technically and heraldically termed, "powdering," the ground with monograms, initials, religious emblems, or even heraldic devices. This was of very frequent use—good instances are those of the crypt at Canterbury, and the south chapel of the parish church at Ewelme, in Oxfordshire. Occasionally a curtain hanging in loose folds was conventionally depicted when the space to be covered was comparatively small and great richness of effect was desired. Examples of this are more common in the Low Countries than in England. Tracery patterns giving the effect of pierced stone or woodwork are also to be met with, but more frequently upon wooden roofs. The range of colours was small; but the changes were so cleverly rung upon them that a great variety of colour and richness of effect was obtained. An underlying principle of Gothic decoration is transposition of colours: thus, when the same design is repeated over a wall surface, upon roofs, or, still more noticeably, upon screen panels, though each repetition may be identical in outline, and the same tints are employed, their relative position is so changed as to vary the effect most pleasantly. Devices in distinct colours or in gold were sometimes overlaid upon these diapered grounds. Occasionally, tablets representing pictures were overlaid in this way. Sometimes diapered or powdered patterns were carried over the whole wall from floor to cornice; sometimes a dado was formed by a band of ornament of a distinct colouring dividing the upper pattern from a lower and simpler one, or from a plain coloured surface, and in some instances, where a simple pattern extended over the general wall surface, a much richer design was used in recessed niches or on the jambs of window and door openings. The ornamental bands which were used to form dadoes, or to divide a space into panels, were frequently of rich and complicated design, but oftener simple tracery patterns contained by broad lines. The projecting mouldings—labels over doors, windows, niches, sedilia, and the like—were much enriched with parti-coloured bands, special twists, waves, and conventional round or square-headed flowers. Carved enrichments, such as the caps of piers, bosses, and finials, were generally gilded, though occasionally painted yellow to represent gold. The treatment of moulded woodwork was more elaborate and minute, as we shall notice further on. To enrich ornament as it ascends is an admitted principle of design. It is an expression of the natural tendency of the human intelligence to seek a climax, and is founded upon a broad rule of nature. The flower is richer than the stem, the head is finer than the body. So in art the smooth shaft leads upward to its carven capital, the mullions tend to the traceried window-head, the tower terminates in its fretted battlement, as the jewelled crown or mitre surmounts the rich robes of monarch or priest. In the interior of a Gothic church, where the predominance of upward lines, that aspiring tendency which is at once the essence and poetry of Gothic art, leads the eye naturally to the roof, it must ever be the culmination of any scheme of decoration, the crown and glory of the work. And there can be no nobler field for decorative painting than the roof or ceiling of a lofty building, and that this was fully realised by Mediæval artists we have abundant testimony. In the embellishment of stone-groined roofs painting was less used than upon roofs of timber; and naturally so, for the smooth masonry of the vaulting was often, as in Westminster Abbey, relieved by courses of different-coloured stones, and formed an ornament in itself. Sometimes, however, the masonry was tinted all over, and painted with elaborate designs—foliated, scrolled ornaments, and emblems. We have instances of this in the Lady-chapel at Chichester, and in many foreign churches, as at St. Jacques, Liège, at Bruges, at Haarlem, and elsewhere in the Low Countries and Germany. Sometimes the apex only of each vaulting compartment, formed by the groin ribs where they converge upon the central roof-bosses, was painted; but whether the vaulting was painted or left plain, the moulded ribs were, as a rule, richly coloured and gilded, sometimes for a few feet only from their central intersection, but often for their entire length; and the carved stone bosses were almost always gilt, and relieved with colour. The ribs were sometimes merely treated with broad bands of different colours running transversely across the mouldings; but often each moulding was separately coloured, as was invariably the case with woodwork, and very generally the round members were ornamented with a spiral twist, or "barber-poled" pattern. In some cases, where weakness of walls or considerations of expense prohibited the use of a stone roof, wooden groining was used in its place, and was decorated in a very similar manner. The beautiful choir roof of St Alban's Abbey is the best instance I can call to mind. But it was in the treatment of open-timbered and panelled roofs that the greatest skill and ingenuity were shown by English painters. One of the most complete and effective, though at the same time simple, instances of the decoration of an open-timbered roof is that of Palgrave, in Suffolk, illustrated by Brandon. It is a roof of simple form, spanning a nave of 20ft. wide; the rafters, as usual in these roofs, square faced; the principal timbers, and cornice richly moulded. The ground colour over the whole roof is white, upon which the decoration is painted in two tints only—red and dark grey. The faces of the rafters are ornamented with a tracery pattern in dark grey on white; their sides are red, and this treatment of the sides merits particular attention, for it gives a very rich and glowing effect to the roof when looked at obliquely from east or west; whereas, if the spectator stands facing due north or south, and looks at the roof in front of him, he misses the red rafter sides, and gets a general effect of white and grey, relieved only by the wavy-rayed red stars on the boards between the rafters. Of all the 15th-century coloured roofs that I know that of Palgrave seems to me to offer the best instance of an extremely simple and highly artistic treatment. No gold is employed in this roof, and only two colours besides white are used. Other good instances of the colour treatment of open roofs are those of Ufford and Blythburgh in Suffolk; Sall, Knapton, and the south transept of Aylsham in Norfolk, and Aldenham in Hertfordshire. Knapton, illustrated by Brandon, is, in my opinion, more curious and interesting than decoratively successful, a strong ochre tint being laid over principals and rafters, and the carved angels on the hammer-beams being rather vividly coloured in reds and greens. Blythburgh and Sall show designs of the same type. The nave-roof of the latter is coloured entirely in dark grey and red on a white ground; that of Blythburgh, one of the most delightful and delicate examples that I know, is in red, dark green, and bluish-grey, and is full of freely and finely-drawn stems and tendrils and four-leaved flowers. Sall shows a curious use of a tracery design, the piercings simulated in black or dark grey. Aldenham differs widely from all the foregoing, which are all of a typical East-Anglian type, a bold diaper pattern in red and black being painted upon the faces of the rafters, while a scrolled rose design, on a white ground, ornaments the sides of the principals. There is a quaint little Agnus Dei in black, repeated at intervals along the cornice. The rose pattern is in some respects similar, though very inferior in drawing, to that on the remains of the Ringers' Gallery at Trunch, Norfolk. The treatment of ceiled roofs was, of necessity, different to that of open roofs. The surfaces of these ceilings were usually divided into square or oblong frames, by means of moulded intersecting ribs—though in some instances these ribs were simulated by painted bands. A common and simple method of decorating these panels was to paint them a soft blue, and to fix upon them a number of small gilded leaden stars—as a suggestion of the firmament. The ribs were painted in various colours, each moulding receiving, as a rule, its distinct tint. Sometimes they were partially gilded, but gold was generally reserved for carved or cast-lead enrichments, for curved or broken surfaces, and not for flat treatment—a point worth noticing. Occasionally the panels were "powdered," as in the north aisle at Wymondham, with initial letters. By far the most usual and typical design for square panels was that of a large monogram—a device such as the Agnus Dei, as at Dereham, Norfolk; the chalice, as at Thaxted, Essex; and the flaming star, as at Minster Lovell; angels holding shields or scrolls, as at St. John's, Madder Market, Norwich; and at St. Alban's Abbey, inclosed in a circular wreath. The wreath, which may have typified the crown of thorns, is always of a purely conventional character; sometimes a mere scrolled circle, but oftener throwing out branches to fill the corners of the panel—simple, as at Minster Lovell and St. Alban's, or elaborate, as at Dereham. Representations of parchment scrolls, bearing mottoes or sentences from the Liturgy, were frequently used as roof ornaments. In the beautiful little Clopton Chapel at Long Melford, we find small scrolls repeated at intervals upon the red rafters of the flat roof, bearing the prayer, "Jesu, Mercy and grammercy," while a larger scroll wound round a twisted stem bearing flowers and fruit, all carved in relief and coloured, runs along the wince and sides of the beams. A very splendid panel decoration (illustrated by Colling) is to be seen at the east end of the south aisle of St. Mary's, at Bury St. Edmund's. The initial letter G, of the motto, "God me Guide, grace me govern," which traverses the panels diagonally, is as ornate and relatively as minute as a corner letter from an illuminated missal. Round bead mouldings were generally—almost invariably—treated with some variety of what we call "barber-poling"—a suggestion of a riband (the very word is suggestive of this treatment, "ribband") wound round a pole spirally. This ornament is usually in two colours only, and those grey or black and white, sometimes red and white, and less frequently in red, grey, and white. On the small round mouldings of the screens we find an infinite variety of these twisted spiral designs in gold and black or blue, gold and red or green, and in combinations of red, green, black, grey, and blue, with white, and not always in the form of a single twist, but elaborated into various graceful forms. The treatment of screens, pulpits, font-covers, and wooden furniture generally were, in method and principle, much the same as that of roofs, but naturally different and much more minute in detail, finer in drawing and design. The work was near the eye, and capable of close scrutiny; the surfaces to be decorated were smoothly wrought and comparatively small. Oil-colour or tempera, which could be brought to a firm face, was used; and patterns and ornaments were often extremely minute and exquisitely finished. The panels of chancel and parclose screens, and of pulpits and reredoses and doors, were frequently painted with figures of saints, angels, apostles, or doctors of the church, kings, queens, bishops, and occasionally allegorical representations of virtues. Gilded gesso in low relief was often used for backgrounds, and for crowns, jewels, and other ornaments. The rich mouldings of muntins, transoms, and tracery were still further enriched with waved ornaments in two colours, with small four, five, and six-leaved flowers in gold or with gilt centres and points, or with delicately-painted sprigs in brown or dark green, bearing red or blue flowers. The carved crestings which abounded were usually gilt, and gold was freely used in the mouldings and panels. The latter, where gilded backgrounds were not used, were usually painted red and white, or green and red, in alternate panels, these colours being almost invariably counter-changed in the traceried heads. The figure-subjects of these panels, though sometimes crude and poorly drawn, are occasionally of great beauty. Those in the screens at Southwold and Ranworth* are admirable works of art—poetical in expression, magnificent in colour, gloriously decorative—while other instances are hardly inferior. The raised and gilded gesso backgrounds of Southwold are more finished and beautiful than any others of the kind, and are suggestive of a method of decoration which we might employ to great advantage. The Southwold mouldings are lavishly adorned with small gilded gesso pateræ, and with painted sprigs and flowers, the blue cornflower occurring repeatedly upon a white ground. I would now invite your attention to the more important lessons to be derived from the study of ancient methods. The first of these is the restricted use of colours—the simple gamut of four or five tints—the breadth obtained by the predominance of a prevalent colour The second is the counter-change or transposition of colours, as in alternate panels or roof bays; this is a most pleasant and successful means of avoiding absolute monotony of effect. The third is the subordination of figure subjects, such as screen panels or mural frescoes, to general decorative effect. One is so apt, nowadays, to see this condition reversed, with the result that the figure-subjects swamp the decorative scheme and become obtrusive. Figure-subjects should be sparingly used upon a roof, except, perhaps,

* Illustrated in our issues of the 13th and 29th ult.

upon a low roof, and then upon panels either vertical or inclined only at a very steep angle. Figure-subjects inevitably attract minute inspection, and such inspection of an object high above one's head is ever a more or less painful effort. There can be little doubt but that our modern method of producing roof and wall decorations in churches is substantially the old method. We transfer our designs to wall or roof by means of "pouncing." The design—for a panel, rafter-face, or interval, or for the repeat of a diaper, or for any decorative device—is drawn full size upon a sheet of strong paper—it may have been parchment or sized linen in the old days—and this sheet is laid over another sheet, under which is placed a cushion or pad, such as a folded rug or blanket. The outlines of the design are then carefully pricked with some sharp tool—a large needle set in a cork does as well as any—through both sheets into the cushion, and are thus transferred from the first to the second sheet, which receives the design outlined in pricked holes, and is then called a "pounce." This pounce, or pricked sheet, is then held or pinned to the surface to be decorated, and the outlines are dabbed over with the pounce-pad, a little bundle of rags tied up in linen, and dipped now and again into a saucer of powdered colour, generally black if the ground-tint is white or light-coloured, and white if it is dark-coloured. Thus the outlines of the design are transferred in dotted lines to the surface of the work, and the painter has then to fill them in by hand with their respective colours. Conventional flowers, square or round pateræ, are quickly done by the use of stencil, which needs no description. But the less stencilling is used the better will be the result. The stencil is too mechanical—it is a cheap and soulless method. Lead ornaments, suns, stars, and the like, are cast from carved wooden models, and screwed to the timbers, or to lead plugs in case of walls. They are generally gilt or coloured before fixing. I would not advise their use when better means are available; but when, as is generally the case, it is desirable to get a good effect cheaply, they are very useful. It is generally best to keep roof and wall treatment very flat; little shading should be used. A few dark pencillings may be used with advantage to give an effect of roundness to a crown or chalice, for instance. It is often necessary, particularly on roofs, to accentuate outlines in dark colour, the strength of such outlining being of course, proportionate to the light of the building or the height of the design from the floor. As a matter of general principle, the colours used for walls or roofs should be soft and subdued, but decided and dead—that is, free from gloss, so as to present a refracting surface. If oil-colour is used, the final coat should be "flatted" or deadened, but on dry walls or upon roofs distemper does perfectly well, is cheaper, and has the advantage of being much more easily removable from the walls or floor, upon which spots are seen to fall from the painter's scaffold. Design at a considerable height or upon dark-toned grounds should be comparatively simple and bold; a white ground seems to demand more enrichment. The amount of gold-leaf used and its distribution must depend upon the nature of the design and the scheme of colour; but it is generally well to confine it to such portions as it is desirable to enrich more freely than the rest. Thus in a chancel roof the easternmost bays over the sanctuary may be, according to traditional use, treated with especial richness of design and colour, and more copiously gilded. The gilding can be lacquered, glazed, or deadened to relieve it of the tinselly effect it is apt to have. The average lights of the church must be considered; it is dangerous to choose your colours on a very bright or a very dull day, unless you can make allowance for changes. The light of a church interior is generally affected by the tones of its window-glazing, and the colours must be toned to suit it. Another factor which must not be overlooked is the natural blue of the atmosphere, quite appreciable in our misty climate. It is often necessary, for instance, when reds or greens are used, and are carried to a great height, in order to maintain an apparent evenness of tone, to infuse more and more yellow into the colours as they near the apex of the roof; without this precaution the red is apt to look purpley, the green too blue. In short, it is only by careful experiment, and by observing the effect of colours at different heights, and in varying lights—gaslight especially included—that the tints should be decided. Before leaving the subject of decorative painting, I should like to say a few words about a process which has barely been introduced into this country, but which promises well. It is called the German Imperishable Fresco process, and professes to give results in wall-painting which are practically imperishable, a profession which its use in Germany, and recent experiments in England, seem amply to justify. For my knowledge of this process, and for the examples of materials and colours which I am able to show you, I am indebted to the Rev. J. A. Rivington, of Littlehampton, who read a paper upon the subject before the Society of Arts in February, 1884, and who has been good enough to give me a personal interview. The process is one invented, and perfected after years of labour and research, by Mr. Adolf Keim, of Munich, and consists in the use of pigments prepared from mineral earths, and mixed with distilled water, upon a ground of mortar formed of special ingredients, the work being finally glazed or "fixed" with a solution of silicate of potash, treated with caustic ammonia and caustic potash. The mortar which forms the ground is composed of the finest white quartz-sand mixed with quicklime, slaked with distilled water, in the proportion of eight parts of sand to one part slaked lime. For work executed in the exterior of buildings—for which the process is specially available—Mr. Keim recommends the use of pumice-sand in addition to the other ingredients. It is essential that throughout the work only distilled, unfiltered rainwater should be employed, to obviate the possibility of the presence of lime in the water, as that would affect the solution used for fixing. The colours present a full scale of forty-one in number, and are chemically prepared to anticipate any chemical change to which the conditions of the process may give rise. The only medium used is distilled water, and the tints are applied from the palette with ordinary brushes and in the ordinary way. They can be combined, toned, and modified precisely in the same way as ordinary water-colours. The process, in fact, presents no difficulties to the manipulator. The fixing solution, which is applied with a spraying apparatus, has the effect of forming a hard surface of silica which is absolutely impervious to damp, smoke, dirt, or the acids of the atmosphere, and which can be washed and scrubbed to any extent; furthermore, it is perfectly dead and presents no glaze or refracting surface. A fresh process, which gives results impervious to damp and the deleterious action of carbonic acid gas, is one which commends itself for use in England, and particularly in London. This German process seems peculiarly applicable to mural frescoes, and especially to figure subjects, the costly nature of which renders their preservation a matter of the first importance. Artists and their patrons are frequently deterred from the execution of frescoes by the unfortunate fate of many modern works which have relied upon perishable processes. I have treated so far entirely of decorative painting. I should like to add a suggestion of other methods. First, of the use of coloured stone for the internal faces of walls, for piers, arches, and mouldings. Finely-coloured stones, suitable for interiors, are to be found in many localities — none, perhaps, more satisfactory than some of the red stones of the northern counties and of Scotland. Red stone may be combined in alternate courses or panels with white, grey, or creamy yellow, and may be carved and enriched with gilding, or moulded and relieved with colour. Coloured stone might be very well used as a dado or base treatment to a wall painted or treated in pargetting or sgraffito work. Of the latter means of decorating church walls considerable use has already been made in England. The sgraffito process will be too familiar to you to need description. Another decorative possibility is the application to walls of raised designs in indurated plaster or cement, pressed or moulded, which may be coloured (by the ordinary or the German process), or gilded to any required extent. Still another, for wainscoting or for screens or seats, is the use of dyed woods. In conclusion, I should like to say a few words about what is perhaps the most glorious and least perishable of decorative means—the use of glass mosaics. I am indebted to the Venice and Murano Company, who have done so much towards the revival of this splendid art, for the loan of a few specimens of their work. One is very apt to become prejudiced against the use of glass mosaic in England, by the half-hearted and unsuccessful attempts which are unfortunately so common. Personally I am of opinion that mosaic should, as a general rule, be used only upon broad surfaces, in a mass, and not for small subjects which are brought near the eye—such as reredos and pulpit panels. For one of the great charms of mosaics is the uneven placing of the tesseræ, which gives a delightful texture to the surface when seen from a distance, but which, when closely inspected, breaks up and interferes with the design. It is an evident mistake to try and perform in one material what is better done in another, and for small panels painting is more suitable than mosaic. A study of the glorious roofs of Venice, Murano, and Ravenna leads to the conclusion that the most effective use of mosaics is upon the concave surfaces of domes and vaults, and a very splendid effect might be achieved by the use of mosaics in Gothic vaulting, the ribs being of deep red stone. Unfortunately, the ever-prevailing consideration of cost prevents the free use of mosaics; but there is a growing feeling in their favour. I have not found time to speak of many elements in the decorative effect of a church interior which merit close and careful attention. The floors, the hangings of the sanctuary and altar, the metal furniture, and above all the window-glazing, are important items of the general effect. What is needed is that the study of church decoration should be more general, that churches should be designed with a view to the highest decorative effect, and that in lieu of handing over one of the most delightful branches of their art to the decorative specialists, church architects should, as far as possible, design their own decoration. For without it their scheme is incomplete, and their efforts may be marred and frustrated by the subsequent endeavours of another. When they do not find that they can trust their own capabilities, they would do well, if possible, to consult their decorator before designing those features of their building which are destined to be the field of his labours.

Mr. William White, F.S.A., proposed a vote of thanks to the lecturer, and referring to a lecture he himself gave at the Architectural Museum on a similar subject, remarked that he could not say he had advocated the use of colour with more force or enthusiasm than had Mr. Warren. Of all the æsthetic elements, colour was one of the most necessary and useful. The architect should first endeavour to introduce colour constructionally, and could then seek to introduce it decoratively. In his church of St. Saviour, Highbury, the speaker employed alternating courses of coloured bricks, of course keeping the darker tones of the work in the lower part.

Mr. Frank T. Baggallay, in seconding the motion, spoke in terms of praise of the paper, and of the diagrams and models by which it was illustrated. The day had not long passed when one saw no colour in a church, all being plain, ghastly whitewash, but especially since people had found by experience that no great expense was involved by a simple scheme, colour had come more into favour of late; indeed, it was surprising the effect which could be gained with colour by a comparatively small outlay, constructional decoration being relatively much more expensive. The development of a scheme certainly involved some trouble, which chiefly fell on the architect. Mr. Warren had not troubled them much with theories of decoration. The number of schemes of decoration which could be adopted in a church must necessarily be limited; but one could always find one subject leading on to a train of others. Simplicity of colour was very desirable; the wider the range of colours employed the greater was the demand on the knowledge of the designer.

Mr. F. M. Simpson considered that the secret of successful decoration lay in the use of few colours—low tones of blue and grey, for instance, blended well with decided red. Messrs. Bodley and Garner had in one of their churches used two patterns of diaper, the richer one being reserved for the east end, with splendid effect. It was well to recollect, as the lecturer had remarked, that stained glass in a church might affect the scheme of colour materially. Sgraffito afforded an excellent means of treatment, if one could be sure that the colour would be good.

Mr. Arthur Earle referred to the splendid effect produced by colour in the Russian cathedrals, where the effect was much richer than any we were accustomed to. He specially instanced St. Isaac's Cathedral, at St. Petersburg, and

one of the chapels at the Kremlin at Moscow, as examples.

Mr. F. HOOPER suggested that where economy had to be studied in building a new church, the architect would do well to bear in mind that at some future time some well-disposed person might wish to enrich the fabric with decoration, and he should, therefore, leave broad surfaces to invite and facilitate such works of completion.

Mr. C. M. BRODIE and Mr. SKIPWORTH endorsed many of the author's suggestions.

Mr. F. R. FARROW alluded to the careful study given to colour decoration by German architects, and expressed a hope that the use of decoration in our churches would be a step towards the introduction of figure painting. The light and the fittings, and other peculiarities varied so much in every building, that it was impossible for the architect to prepare a scheme of decoration for any particular building until he had studied it. In a dark church the effect of gold was disastrous; indeed, in a badly-lighted building it was hazardous to use gold upon colour.

The PRESIDENT, in putting the vote of thanks, remarked that for churches in smoky neighbourhoods marble and other constructional forms of decoration were preferable to paint, as being more permanent.

Mr. WARREN, in reply, said he agreed with Mr. Baggallay that colour was a powerful weapon for the architect to wield, and needed careful handling. A scheme of decoration could not be prepared by theory—it must rather be felt by the decorator. In colour, as in music, the man who theorised most was not likely to do good practical work. As to Mr. Earle's suggestion that the great churches of Russia were worthy of study for their decorative treatment, he thought their very different style would give any work founded on them a bizarre effect unsuited to this country. He was not averse to the use of whitewash in churches when they were richly fitted up, and it had a very good effect as used in Belgian churches; but he decidedly objected to the employment of pointed rubble work in the interiors of churches.

THE LONDON COUNTY COUNCIL.

IT will be remembered that a fortnight since the Council received from a joint committee a recommendation that Mr. F. E. Duckham, engineer to the Millwall Docks, be elected chief engineer. This was referred back, a charge of nepotism having been raised. On Tuesday last the committee again reported, stating that they had had before them seven candidates for the office. They had come unanimously to the conclusion that Mr. Clement Dunscombe, the city engineer of Liverpool, was the best qualified for the office. In accordance, however, with the usual practice of submitting three names, they also submitted the names of Mr. J. Allison, the city engineer of Manchester, and Mr. A. R. Binnie, water engineer in the service of the Corporation of Bradford. They recommended—"That Mr. Clement Dunscombe be appointed chief engineer to the Council, at a salary of £1,500 a year, upon the following conditions:—That he hold his office during the pleasure of the Council; that he be required to give his whole time to the duties of his office, and be not allowed to take any private practice; and that, on retirement, he shall not be entitled to any superannuation or pension."

The Deputy-Chairman (Mr. Haggis), as chairman of the committee, in moving the adoption of the report, said that Mr. Dunscombe had had a long experience in regard to municipal engineering work. For about 22 years he had been connected with different municipalities. He had held the post of municipal engineer at Derby, and for 12 years at Liverpool. He had had a great deal to do with drainage and sewerage works. In Derby alone £700,000 had been spent in connection with sewerage schemes, and at Liverpool £300,000 had been expended under his direction. He had had a great deal of experience with regard to street improvements, and was also well acquainted with the work of the erection of artisans' dwellings. He was 43 years of age. On Mr. Dunscombe's name being put to the Council, he was unanimously elected.

At the same meeting the Housing of the Working Classes Committee submitted suggestions at which they had arrived in conference with the medical officer and the architect with reference to the arrangements that should be made in any buildings that might be erected under the control of the Council for the housing of the poorer classes. These suggestions have regard particularly to the construction of staircases, basement-floors, bathrooms, and closets, and the size of the rooms. As to size, the following recommendations were made:—"In a one-roomed tenement the minimum superficial area should be 144ft. This would conveniently be provided in a room measuring 12ft. by 12ft. A two-roomed tenement should have a similar room, with an additional room containing 96 superficial feet, or measuring 12ft. by 8ft. A three-roomed tenement should have a large room containing 144ft. in superficial area, and two rooms each containing 96ft. Four-roomed tenements need not be provided, but if they are, the fourth room should be of about 100ft. superficial area."

ROBERT BOYLE AND SON, LIMITED.

THE fourth annual general meeting of this company was held at the City Terminus Hotel, on the 27th inst., when a dividend of 12 per cent. was declared, one-sixth of the profits earned being placed to the reserve fund, and a balance of £2,371 9s. carried forward to next year. Mr. Robert Boyle, the managing director, in acknowledging the vote of thanks unanimously accorded to the directors, said: In thanking you for the very flattering manner in which you have received and recorded your approval of the report your directors have submitted to you, I can only say that no effort has been spared to bring affairs to the satisfactory state in which you find them, each year showing a substantial increase of business on the previous one, the year ended having been the most prosperous since the formation of the company; and I am pleased to say that I have good reasons for believing that this progress will continue in the years to come, there being a growing demand both at home and abroad for the ventilating and sanitary appliances manufactured by the company, upon which improvements are being made from time to time, rendering them more efficient and valuable. This has especially been the case with the air-pump ventilator, which I have recently still further perfected, and when the whole of the experiments and tests are finished, I hope to produce a ventilator that will be as nearly perfect as it is possible for an automatic ventilator to be. The present form of the air-pump ventilator is made of the best rolled steel plates, galvanised and painted with enamel paint, whilst the workmanship is of the highest class, and though in every way greatly superior to the forms previously manufactured, is now sold at about 50 per cent. less in price; this, as you will understand, naturally reduces our profit on each ventilator to a minimum; but the great increase in the sales which has resulted enables us to pay each year a 12 per cent. dividend, and this year, after placing one-sixth of the profits to the reserve fund, to carry forward the substantial balance of £2,371 9s. It is to be regretted that the cause of sanitary science is injured to no small extent owing to unscrupulous persons who, noting the success of a valuable invention, try to foist upon the public utterly worthless imitations, purposely "got up" to resemble the external appearance of the article copied, for the purpose of misleading; but these harpies sooner or later—generally sooner—find out to their cost that architects are quite as well able to tell as other folks when they are getting value for their money, and that certain things, though offered at a seemingly low figure, may be dear at any price. I am pleased to say that the agencies established in Germany, France, Russia, Belgium, Italy, Spain, Holland, Denmark, Norway, and Sweden, continue to yield highly satisfactory results, the air-pump ventilator and other appliances being adopted with considerable success in a large number of important public buildings in these countries, whilst we are having numerous inquiries from India, China, Japan, Australia, and the Cape, in which countries we have already applied our system of ventilation to many of the principal public buildings, and I have no doubt whatever but that with the steps we are taking, the business of the company in this direction will continue to increase. I am also satisfied from what I saw during my visit to the United States and Canada that there is a wide and promising field in those countries for the company's appliances, there being practically only one form of automatic ventilator in use, and that a very old-fashioned and inferior one, besides the primitive open pipe, which in the buildings I examined where they were employed I found to be invariably stopped up to prevent down draught, they being found in America to be subject to and unfavourably affected by the same conditions as in this country, and which Sir Douglas Galton, president of the Sanitary Institute, and other authorities, assert prevent, and always will prevent, an open pipe from being a reliable ventilator, and, of course, a means of ventilation which should therefore never be employed. In the course of our business we have removed many thousands on this account from all classes of buildings. From interviews I had with President Harrison and other leading American statesmen, I understand that the present administration are taking all sanitary questions vigorously in hand, which should lead to an increased demand for improved sanitary appliances, amongst others those manufactured by this company, which are already in successful use in the States, as you would see from recently-published reports of experiments with our system of ventilation in America, and which have already led to practical results in the form of orders received. Plans and estimates have also been furnished for the ventilation of the Mormon Tabernacle and the new Mormon Temple, Salt Lake City, the Canadian Houses of Parliament, Ottawa, and the Pennsylvania Railroad Company's new works at Altoona, whilst plans are in course of preparation for the ventilation of the new Municipal Buildings, San Francisco, and other buildings.

BUILDERS' BENEVOLENT INSTITUTION.

AN election of one pensioner on the funds of this Institution took place at the offices, 4, Vernon-place, Bloomsbury-square, on Thursday, the 28th ult., Mr. J. W. Hobbs, J.P. (President), in the chair.

There were seven candidates for the one vacancy—viz., three men and four women. Shortly after the close of the poll the scrutineers, Messrs. Stirling and Ryder, announced the result to be as follows:—James Picking, Clapham Junction, aged 62, builder (seventh application), 3,503 votes; Robert Childerhouse, Paddington, aged 74, builder (second application), 1,529 votes; Charles Sabey, Islington, aged 70, builder (first application), 534 votes; Margaret Alice Richardson, North Shields, aged 65, widow of T. B. Richardson, builder (second application), 653 votes; Mary Ann Shapland, Lambeth, aged 70, widow of William Shapland, builder, (first application), 146 votes; Emma Bird, Paddington, aged 60, widow of Joseph Bird, builder (first application), 2,579 votes; and Elizabeth Darby, Clapham Junction, aged 80, widow of Edward Darby, builder (first application) 346 votes. The successful candidate was therefore declared to be James Picking.

Among the friends of the Institution (other than those already named) who took part in the proceedings were Messrs. Geo. Plucknett, J.P. (hon. treasurer), W. Scrivener, J. T. Bolding, C. Bussell, F. Foxley, J. T. Bolding, R. Richardson, and C. Ansell.

The proceedings closed with votes of thanks to the chairman and scrutineers.

The celebrated Belgian decorative painter and architect, Charle-Albert, died in Brussels on Wednesday week, aged 68. He began life as an operative house-painter. One of his most remarkable works is his Flemish Renaissance mansion at Boitsford, near Brussels, which has become one of the most-visited curiosities of the Belgian capital. During the last years of his life he was engaged in the restoration and decoration of the feudal manor or Gaerbeck, near Brussels, belonging to the Marquise d'Arconati Visconti, which was to be the *magnum opus* of his life. He had frequently been engaged in artistic work in England.

On Saturday night the final deposit of plans for Bills coming before Parliament next session was made in the new Private Bill office, Westminster Hall. The great feature of the session will be the great influx of electric lighting Bills, of which there are over 400 deposited at the Board of Trade. The figures for the plans deposited last year were—for railways, 47; tramways, 14; miscellaneous, 54; and provisional orders, 46—total, 161. This year's list comprised 67 railways, 12 tramways, 59 miscellaneous, 35 miscellaneous provisional orders, and 159 electric lighting provisional orders, making altogether 335, or more than double the number deposited last year.

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ILLUSTRATIONS.

INTERIOR OF ST. MARK'S, VENICE.—EXAMPLES OF CHURCH DECORATION.—QUEEN'S GATE HALL, SOUTH KENSINGTON.—DOORWAY TO ST. ERASMUS CHAPEL, WESTMINSTER ABBEY.—DAIL-UAINE DISTILLERY, STRATHSPEY.—"HILLDENE," HAMPSTEAD.—A GROUP OF MUSIC-ROOM FURNITURE.

OUR LITHOGRAPHIC ILLUSTRATIONS.

INTERIOR OF ST. MARK'S, VENICE.

This most perfect specimen of Byzantine architecture, glowing with all the colours of Eastern magnificence, crowned by golden domes, and elaborated with Christian sculptures and mosaic, is too well known to need further descriptions here; suffice it to say that every portion of this wonderful building is a precious work of art. In the Building News for August 31, 1888, when giving an exterior view of the church, we printed a somewhat lengthy account of the fabric, and we may here usefully refer to the plan by Sir Gilbert Scott, which we published in our pages for April 4, 1873. In our issue for Dec. 19, 1879, our readers will find a perspective view of the west front, accompanying a descriptive article on the building. The present interior, looking towards the high altar, shows the principal dome, the screen in front of the choir, and the transepts out of the crossing. The mosaics in the dome represent Christ upon the Throne between four archangels, and the Madonna and the Apostles. Between the windows in the drum are the Christian Virtues, and below in the pendentives the Evangelists and the Rivers of Paradise. On either side of the great screen are marble pulpits. That on the right is used for preaching, and here the newly-elected Doge first showed himself to the people. From the double pulpit on the left the Evangels are chanted above and the Epistles below. The fourteen marble statues on the rood-screen represent the Twelve Apostles, the Madonna, and St. Mark. The brothers Jacobello and Pietro Paolo Masegne designed and sculptured them about 1394. On the left of the nave is the Crucifix altar, with six columns of the finest marble, having gilded capitals. The choir stalls, with intagli of wood, date about 1536, Above on both sides are six bas-reliefs in bronze, with incidents from the life of St. Mark, by J. Sansovino. On the railing to the sacrarium are eight figures in bronze; the four Evangelists, by Sansovino, and the four teachers of the Church, by G. Caliari (1614). The high altar stands under a baldacchino richly gilded, resting on four columns of Greek marble, decorated with Biblical scenes carved upon them. The sculpture seems to belong to the Western school of the 11th century. The altar piece is only exhibited on great occasions. It is an incomparably rich fabric of gold, ornamented with pearls and precious stones. The enamel paintings upon it are of the rarest beauty. It is divided into two sections, of which the upper, upon silver plate, belongs to the 10th century, and the lower, upon golden plate, to the 11th and 14th centuries. The work was prepared in Constantinople in 976 or 1105, and enlarged in Venice afterwards. The antique-like mosaic in the apse of the Majesty is by Petrus, and is dated 1556. In the vault above the choir is Christ blessing, with St. Mary, David, Solomon, and eleven Prophets. In the sides of the vault are mosaics of scenes from the history of the Apostles.

EXAMPLES OF CHURCH DECORATION.

The diaper pattern from Wells Cathedral, which occupies the left-hand top corner of the page, is an unusually fine and delicate example of English decorative painting. It occurs in panels, in red and brown, and in light and dark green alternately, upon the shrine of Bishop Beckington, and is thoroughly characteristic of the 15th-century manner. Below is a bold diaper design executed for me by Messrs. Wheeler Bros., of Reading, in sgraffito, in red and toned white. The traceried design which is at the right-hand of the Wells diaper, is from the rafter faces at Palgrave Church, where it is painted in dark grey, or black on white. The ornamental band, with a tracery design, was designed by me for use at All Hallows' Church, East India Dock-road. Below it are two roof panels; the upper from the sanctuary roof at Minster Lovell, Oxon, of Late 14th-century design, is executed in dark red and white. The lower is a model design of my own—one half real size—executed as an illustration of my paper by Messrs. Powell Bros., of Lincoln. The ground tint is white, and the wreath and flowers in dark green and red. At the bottom of the page are a cross and some initial letters designed by me for the chancel of St. Andrew's, Dynas Powis, near Cardiff, where they are painted upon a scroll below the cornice. —E. Prioleau Warren.

ALTERATIONS TO QUEEN'S GATE HALL, SOUTH KENSINGTON.

These illustrations show some alterations which have been carried out, and some which will eventually be made, at the Queen's Gate Hall, South Kensington. The buildings were originally three houses; but the want of a hall for dances and concerts being felt in the neighbourhood, the then proprietor added two large halls at the rear, and afterwards an entrance, part of which will be kept, with the addition of a gable, &c., and sculpture, as shown on the left-hand side of lower illustration. The present alterations consisted of erecting two stone staircases to the large hall on the first floor, providing a private entrance and stone staircase to the chambers on second and third floors, arranging a separate entrance and retiring-rooms, &c., for the lower hall used for dances, and altering kitchens and service accommodation. Eventually a new stone front will be added, as shown, to the ground floor, with a new entrance to the lower hall; the large halls will be thoroughly redecorated, a new proscenium will be formed in large hall on first floor, and a supper and drawing-rooms will be provided in the basement. A large room for lectures and classes will also be formed in the basement. The whole of the buildings will be provided with the electric light. This illustration was taken from a drawing by the architect, Mr. R. A. Briggs, A.R.I.B.A., 2, Devonshire-square, E.C, and was hung in the last Academy Exhibition. The builder was Mr. J. Douglas.

CHAPEL OF ST. ERASMUS, WESTMINSTER ABBEY.

The present approach to St. John's Chapel in Westminster Abbey is beneath a beautiful 14th-century doorway through the little passage which now goes by the name of the Chapel of St. Erasmus. This tiny chapel (St. Erasmus) was fitted up to contain the image of some saint, whose name cannot now be discovered, in the reign of Richard II. The outline of the image can still be seen on the wall, and the hole in the roof through which a lamp was suspended by a chain before it. When Henry VII. pulled down the old Lady-chapel, a chantry dedicated by Elizabeth Woodville to St. Erasmus was also destroyed, and it is thought that the saint's altar was temporarily, if not permanently, removed to this chapel. The words "Sanctus Erasmus" were at the same time painted above the doorway by Abbot Islip, who added his name and initials. Originally a wooden screen, with a doorway in the centre like the one in the corresponding chapel of St. Edmund, divided St. John's Chapel from the ambulatory. About 1500 Fascet's tomb and canopy were erected in a line with, and forming part of, the screen, Colchester's already standing within it. Some time after 1523 Ruthall's tomb was placed across the doorway, and the present entrance made by cutting through the altar wall of the Chapel of St. Erasmus. This drawing, from the Royal Academy Exhibition, is by Mr. A. Bennett Bamford.

DAIL-UAINE DISTILLERY, STRATHSPEY.

This distillery is situated in the Glenlivet district, so famous for malt whisky, and stands at a short distance from the River Spey and at the foot of Ben Rinnes. The distillery is one of the oldest in Spey-side, and has recently been greatly enlarged and improved, all the latest improvements and newest appliances being introduced. The maltings consist of an elevator tower, 21ft. by 21ft., of three floors and basement, the latter being formed into a large hopper for the reception of the grain. This tower has been carried up in a Scotch Baronial style of architecture, with embrasured parapet course, corbel table, corbelled angles, and gargoyles. A large pent-roof, supported on cantilevers, is erected on the east side of the tower to afford cover when discharging grain. The malt barns are 210ft. long and 60ft. wide, the malting-floor is formed of cement concrete specially prepared, and around the walls of the barn there is a dado of white enamelled bricks. The floor over the malt barns is occupied principally by a commodious grain-loft, malt-deposits, and two steeps. These latter are each 26ft. 6in. long, 8ft. wide, and 4ft. deep, and are built of concrete, supported on three sides by walls, and on the other side by rolled beams and cast-iron pillars. These steeps are lined inside with white encaustic tiles with draining strands in centre of each, 12in. wide, covered by perforated tiles; the faces of the manhole doors are enamelled, the supply and discharge pipes being cast iron, 4in. and 5in. diameter, and the sparge-pipe of copper. There are two malt-kilns placed right and left of the malt-barns, 25ft. and 30ft. square inside. The kiln floors are laid with perforated bricks with tile skirtings, the openings between kilns and barn being protected by heavy iron sliding doors. Features of the kilns are the chimneys, which are carried up from the hipped roof in a triangular sloping trunk and are covered by large, projecting, leaded roofs, square on plan, with deep bell cast on eaves, and surmounted by finials and lightning conductors. The malt deposits already mentioned run between the kilns and are V-shaped and airtight. They are divided into compartments capable of containing about 20,000 bushels of malt. These are supported on iron columns and sandwich beams with side strutting and iron rods. The distillery adjoins the kiln, and contains stills, engine and boiler, and other brewing appliances. The tun-room, with refrigerator-room (which is placed over the wheel-shed), adjoins the distilling-room and is L-shaped, about 140ft. long by 20ft. wide. The lower floor is of concrete, the walls plastered with Keene's cement and the roof lined and varnished, the ventilation being effected by glass opening sashes, which materially assist the lighting. The offices and other buildings are commodious and of easy access. The buildings form a picturesque group, the roofs being well broken up by small towers and gables. Externally the buildings have a massive appearance, being constructed of a local reddish granite, and the roofs slated with Welsh slates. Internally the buildings are well finished, and the finishings of woodwork varnished, while the whole lighting, heating, and ventilation has been carefully studied and carried out. The contractors for the various works are: Mason, Charles Kemp, Aberlour; carpenter, A. and R. Dunbar, Elgin; plumber, James Ross, Elgin; plasterer, James Brodie, Elgin; slater, John Wilson, Dufftown; machinery, Thomas Petrie, Ballindallock; ironwork, James Abernethy and Co., Aberdeen; tiles, Minton, Hollins, and Co., Stoke-upon-Trent. The work has been carried out from the designs and under the personal supervision of Mr. Chas. C. Doig, architect, Elgin.

The new Roman Catholic Church of St. Michael, Wareham, built from plans by Mr. Vicars, was solemnly opened on the 19th ult.

At a meeting of the directors of the Pocklington Water Company, Limited, held on Friday, the secretary reported that more than the required share capital had been applied for, a considerable portion being taken up by the inhabitants. The tenders for laying main pipes were opened, and that of Mr. T. Bell, of Market Weighton (£1,175), was accepted, and the work was ordered to be commenced forthwith. The engineers (Messrs. Fairbanks and Son, of Driffield and Westminster, S.W.) were directed to prepare plans for the remaining contracts. The scheme is a gravitation one, and the source of supply about a quarter of a mile from the town.

WAYSIDE NOTES.

THE Richmond competition has proved a fiasco of the first order. There will be no little cause for surprise if the affair does not bring you some highly, and justifiably, indignant letters from the competitors. It should do so if these gentlemen will only make up their minds to act in a spirit of boldness, believing that any attempts they may make to expose the manner in which they have been treated by the Richmond Vestry, if not leading to actual benefit to themselves, will yet be a seed-sowing certain to produce much good fruit for the future well-being of the profession at large.

The whole thing strikes me as being simply abominable, and disgraceful to a degree. To retain the services of a most competent assessor, and then, after he has made his awards, to select a competitor whose plans, so far as we can gather, were not so much as favourably mentioned, is a proceeding that will render the enlightened members—eight of them, at any rate—of the vestry of Richmond for 1889 famous in the annals of architectural competitions, and immortalise their names as inaugurators of the same. Theirs is a masterly stroke of business, capping, in its way, anything it has been our good or bad fortune to encounter. No half-doing of things, and no endeavourings to make compromises of one sort and another! The Richmond Vestry go the whole hog; black-ball two gentlemen selected by their own assessor, and set up on a pedestal of fame one whose claims to the honour are not for the moment clear to the impartial onlooker. Perhaps the Vestry may be induced to publish their reasons for so doing; if not, we each, in a very natural way, draw our own conclusions.

How to make the opportunity golden? Here's the rub! The ousted competitors must unfortunately "grin and bear"; but there is surely energy and spirit enough in the whole number, and sufficient of that rather volatile substance, *esprit de corps*, to enable them to call upon the Richmond Vestry to give a written explanation of the why and the wherefore of their erratic proceedings. That things were not altogether what one would desire, upon the occasion of the voting, is to me evident, from the fact that members, including the Rev. C. F. Coutts, were found to protest against the line of action taken, as being unjust to the other competitors. It is quite certain that if architects continue to knuckle down in a quiet and lamb-like manner to such utterly unfair decisions as that for which the Richmond Vestry has become famous, incidents of this nature will continue to be well-defined features in the history of architectural competitions. I hold, therefore, that we have here a case where it behoves all those specially interested in the result of the competition to make a firm protest. Their action will be seconded by all the competitors, I feel assured, and the professional journals and the whole body of the profession they represent will not be aback in interesting themselves in the matter, and in doing all that may lie in their power to aid the good cause. For the sake of our common credit, do not let us pass lightly over this, to all intents and purposes, disgraceful affair.

The appearance of the South Shields Police Offices Competition must have gladdened the heart of those competing architects who pined for foemen worthy of their steel, by which I would convey the impression that small fry, in the way of competition, have lately been the order of the day, barring, of course, the Watkin "Eiffel," of which the architect—having a spark of true sentiment in him—may well keep clear. There is an air of genuineness about the announcement of the South Shields competition that should commend it to the notice of the cautious competitor. The outlay of £10,000 on a building should be sufficient to guarantee that the competition will be carried through in a thorough manner, and free of all those little pettinesses that are the great distinguishing feature of the inferior class of competitions, and that disgust all, except that remarkable body of gentlemen to whom I have often alluded as of the "wholesale and for export" persuasion. Possibly, by the bye, it is this type of competing architect that we must largely thank for the continuance of evils like that in connection with the Richmond competition. Regardless of naught but their own interests, and having expended little of their own not very valuable time on their rough-and-ready exhibits, they care to assist no protest when any manifestly unfair awards are made. If the only result of my having written past "Wayside Notes" were to be that the younger section of competitors were, once and for all, to comprehend the hopelessness and harmfulness to themselves and others, respectively, of working on the "wholesale" principle in competitions, I should feel that I had not written in vain for the welfare of the members of the architectural profession.

To return for a moment to the South Shields Competition, the number of premiums (three) will please the mere premium hunters, even if their total sum does not amount to more than 1 per cent. on the outlay on building. Premium money to the amount of 1 per cent. on the cost of the proposed building, while not an over-liberal allowance, is yet one that is free from the stigma of meanness that characterises so many of our competitions. I will leave others to draw the postal-order for one guinea to ascertain the nature of the instructions and conditions of this competition, feeling sure that, should I part with £1 1s. for so little return, I should forfeit my claim to be believed to be, in the very flesh, an architect.

Mr. G. F. Terry's lecture on "The Present Worth of Architecture as a Serious Life's Pursuit" has apparently been very well received by the profession. All of us, in theory, think that architecture should be regarded in the sentimental light in which Mr. Terry views it; in practice we find that bread-and-cheese considerations are paramount. Yet periodical protests against the prostituting of the art of an architect to commercial ends are certainly necessary. Unprofessional conduct, too, must be kept before us. Unfortunately we hear too much about architects undercutting one another, and of men cutting away the ground from one another's feet without a scruple of any kind. Touching the question of taking work at less than 5 per cent., to which Mr. Terry alluded in his paper, it is only the other day I heard of a very well-known firm of architects agreeing to carry out a job costing, if I remember rightly, about £10,000, for a commission of 3 per cent. Everyone knows I have always spoken against conduct of this sort, and insisted upon the practical truth of the assertion that, if architects show no self-respect, the public will very quickly show that in their turn they will have no sort of respect for architects. Facts like the one stated above soon get abroad, and do great injury to other parties than those immediately concerned. It is a selfish, unprofessional action that I only wish could be more severely reprimanded.

"Pity the Poor Architects," was the heading of a short leader in the *Daily News* last Monday, and of course attracted my eye like a magnet. Referring to Mr. Terry's paper at the Society of Architects, the writer alludes to the complaint made so frequently that the public are not interested in, and know little and care less for, architecture. The *D. N.* takes the reiteration of the complaint in good part, and that is a kindly thing to do, seeing what a smart lay writer of, say, the *Saturday Review* type may hurl against us if so disposed. "Obviously," says the *Daily News*, "the cure for these evils can only be found in a general elevation of the public taste in these matters. Why should not the Society of Architects take us in hand? A propaganda of the true faith in architecture seems to be eminently a thing in their way." Well, the Society has done, and is doing, much in this direction, but the cleansing of such Augean stables is not to be accomplished in one day any more than the building of Rome. And perhaps, after all, the question is still more hopeless, and we only roll the heavy stone a little way up the mountain to roll back again of its own accord, as in the classical myth. We must not be ungrateful, though. Advances have been made, without a doubt, and the next generation of architects will work in more enlightened times, thanks to the endeavours of those of the present day.

If the working classes are not well housed and cared for after the lapse of a few years, it will not be for want of attention on the part of authorities. Mr. Ritchie's latest move—the issue of circulars to Metropolitan vestries, urban and rural sanitary authorities—taken in conjunction with the long hours that the County Council have in the past devoted to the subject, and with Sir Edward Guinness's gift, seems to point to the dawn of an era when, to be well and sanitarily housed, one must be a member of the labouring classes. I am glad to see that Mr. Ritchie has sought the co-operation of the County Council in the matter of the Guinness trust, and hope that all the time, money, and thought now being devoted to the matter will quickly lead to an amelioration of the lot of those whose lives are cast in hard and thorny paths and rendered still more comfortless by the wretched tenements they have to inhabit, and for which, it has been pointed out, they pay a heavier rate of rent than any other class of the community. There is some consolation in remembering that the time of the London County Council at its Tuesday's meeting was not wholly squandered on discussions about supposed injurious allegations against an engineer, but that the Council had a few spare moments to receive some practical suggestions, from the committee it had appointed, on the design of dwellings for the poor. Not that there appears to be much originality in these suggestions. Sizes of rooms are important in their way, but there are other and broader principles to be considered if the object be to overcome the objection to well-to-do persons crowding into buildings intended for the poorest of the poor—the honest poor.

These are the questions that should form the theme of discussion, inquiry, and trial on the part of those intrusted with Sir Edward Guinness's money. Matters of construction of staircases, basements, and sizes of rooms are of secondary importance, and not difficult to solve, having been fairly attacked and partially overcome in past efforts in the direction of housing the poor. The point, as it seems to me, to be kept before those who sit themselves down to solve the problem is, How can the class in question be housed in the cheapest manner consistent with the demands of good building and sanitation, morality, cleanliness, and economical feeding? This problem may be split up into separate ones. How can the principle of co-operative living be best employed? What sort of common culinary department may be designed in connection with a large block of dwellings so that cooking expenses for the tenants may be reduced to a minimum? How can the buildings be best warmed and lighted? How can cleanliness be encouraged among the "great unwashed" by providing bathing accommodation? Questions like these are what it behoves those who would house the poor to ask themselves, before any mere constructional matters or methods of planning. In a word, the problem seems to be the employment of the co-operative principle so broadly and so thoroughly that numbers of poor people may be able to live in all deserved comfort, and with healthy surroundings, with the least outlay, in the form of—mark, *not only rent*, but *clothing*, *feeding*, *bathing*, and all those little comforts and conveniences to which they should be only entitled if honest, hardworking persons—comforts and conveniences unknown to those vast masses of humanity to whom, as Charles Kingsley has said, life is one long *malaise* of mind, body, and soul.

GOTH.

A new hall and club-room which have been erected in David-street, Old Market-street, Bristol, were opened on Monday. The frontage of the new hall is about 100ft. in length, and is treated in the 17th century style in brickwork, with moulded free-stone string courses, red rubbers being introduced for ground and moulded work, and the coves underneath the eaves and the gables over the first-floor windows are finished in sgraffito. The ground floor comprises a secretary's office, three club-rooms of varied size, scullery and offices, and entrance hall with staircase leading to a large room on the first floor, 60ft. by 30ft., having an open timbered roof, a gallery over vestibule, and at the opposite end a raised platform. The large hall is expected to accommodate about 450, and the other rooms will accommodate from about 50 to 70 each. Some 30 or 40 lodges are expected to meet at the hall. The contract has been executed by Mr. H. A. Forse, from the designs of Messrs. Foster and Wood. Mr. Willis was clerk of the works, and the work has cost for site and building £4,000.

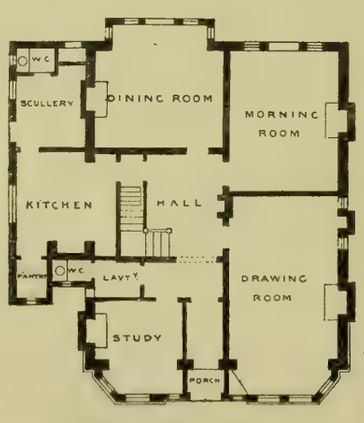
Canon Argles has undertaken to defray the expense of scraping the internal stonework of the nave of Peterborough Cathedral, which is estimated to cost £1,110. The Bishop has given a second donation of £100, and the feoffees of Peterborough £50. The family of the late Canon Pratt have given £110 for a stall to his memory.

An Architect's House at Hampstead N.W.

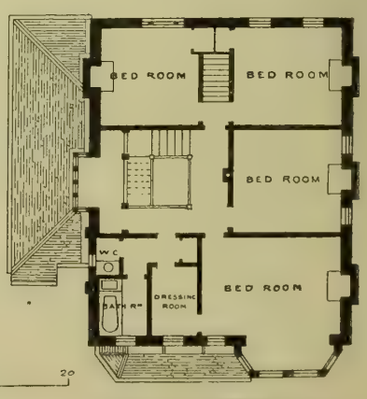
Messrs Wylson & Long Architects



"Hilldene," Hampstead.



Plan of Ground Floor.



Plan of First Floor.

A GROUP OF MUSIC-ROOM FURNITURE

AT THE NEW GALLERY (ARTS & CRAFTS EXHIBITION)



BY W. A. S. BENSON.

CABINET DECORATION DESIGNED BY HEYWOOD SUMNER

SUBJECT "THE CHARM OF ORPHEUS"

E. Chancellor del.

HILLDENE, HAMPSTEAD.

THIS house, the residence of Mr. Long, has been arranged to provide four sitting rooms, an entrance hall, lavatory, and service department on the ground floor on an ordinary plot of ground 50ft. frontage.

The accommodation consists of dining-room, drawing-room, morning-room, and study, with lavatory and kitchen and offices on the ground-floor. Four bedrooms, dressing-room, and bath-room, &c., on the first floor, and two bedrooms and full-size billiard-room above, all contained within the roof, this necessitating a special construction of the roof, the principal framing of which has been made a feature inside the rooms.

The principal staircase is of oak, with close moulded strings, bold, turned newels and balusters, the upper part of hall behind the staircase being formed as an alcove overlooking the entrance hall.

The house is faced all round with red pressed bricks from the Heather brickfields, Leicestershire, with arches and stringcourses of Lawrence's rubbed and gauged bricks, and the roof is covered with red tiles.

The house has been built by Mr. Robert Eddie, of 17, Tyndall-place, Islington, builder, under the superintendence of Messrs. Wylson and Long, No. 15, King William-street, Strand, W.C., architects.

MUSIC-ROOM FURNITURE.

THE chief subject of this illustration is a cabinet for music, made in two kinds of wood. The simplicity of its outline and good balance of its parts place it far above the ordinary run of decorative furniture, which is too often loaded with meretricious and meaningless ornament.

Here the interest centres on the very appropriate subject with which the two large panels are decorated. "The Charm of Orpheus" is an excellent theme for the music-room. The Rhodopeïan bard, who we are told brought tears to the "bloodless spirits" of the Infernal Regions, and melted even grim Pluto himself to give him back his lost Eurydice, by the magic of his useful strings, is here represented attracting by his music the far more impressionable creatures of the upper world. Mr. Heywood Sumner has, we think, rendered the subject well, and has done so through the somewhat rude and difficult medium of incised work. The whole thing is clever and good, and its usefulness has not been lost sight of, for there are shelves and commodious drawers for unbound and arched spaces for bound music. Mr. W. A. S. Benson, designed the cabinet, which was executed by Mr. C. Rogers, and the incised work was done by Mr. G. H. Walton, from the designs of Mr. Heywood Sumner.

The lamp and music chair are also by Mr. Benson. The former is an elegant thing in copper, and stands well on four spreading feet, the upright pillar being steadied by four stays. Such a lamp is far better, and less troublesome a mode, for illuminating the instrument and music than anything fitted to the piano itself.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—LVIII.

By HENRY LOVEGROVE, F.S.I., Surveyor.

WINDOWS.

TWO-LIGHT WINDOW—KINDERGARTEN.

ft.	in.	ft.	in.	
2	11	9		
		4		
		3	1	11 Frame as before.
2	2	6	5	0 5in. by 2¾in. oak sill as before.
2	2	6	5	0 Galvanised iron tongue and grooves in oak and stone, and white lead, and bedding sill in white lead.
		2		2 Frames bedded and pointed.
2	2	1		
	3	8	15	4 2in. deal moulded casements as before.
		2		2 Pairs 3in. brass butts.
		2		2 Tonk's wedge fastener.
		2		2 Do. stay.
2	1	11		
	3	5	13	2 Hartley's glass as before.
		2		2 Frames 4c. white.
		8		8 Squares small 4c. white.
		2		2 Frames S. S. and twice varnish.
		8		8 Small squares do.
		13	10	13 10 Deal 1in. linings 3in. wide, tongued as before.
	15	0		
		4½	5	8 ¾in. deal grounds as before
	15	0	15	0 3in. architrave moulding as before mitred.
	4	0	4	0 Deal grounds, 4½in. wide, moulded both edges.
		2		2 Ends fitted.
	4	0	4	0 3in. architrave moulding as before.
		2		2 Ends fitted.
	7	0	7	0 1¼in. wrot. and rounded window board, as before.
		2		2 M. and R. rounded edge as before.
		2		2 Notchings.
	7	0	7	0 Deal moulding under window board.
		2		2 Mitred and returned mlded. ends to do.
	5	0	5	0 Groove in oak for window board.
2	2	3	4	6 Smith's patent water bar.
	13	10		
		4	4	7 S. S. and twice varnish on linings.
	15	0		
	1	0	15	0 Add on grounds, &c.
	4	0		S. S. and twice varnish, add on
	1	0	4	0 architrave.
	7	0		
	1	6	10	6 Add on window board, &c.
	5	4		
	4	3	22	8 1⅛ B. in mortar ddt.
	7	5		Ddt. extra to random rubble facings
	4	0	29	8 as before.
	5	8		Ddt. R. F. and S. walls, and twice
	4	2	23	7 distemper.
	7	2		
		6		
		4½	1	4 Fir lintel.
	7	2	7	2 Extra to rough arch over lintel, 4½in. soffit as before.
		6		6 Wood fixing slips.
		6		6 Lead plugs as before.

TWO ONE-LIGHT WINDOWS—GIRLS' CLASS-ROOMS.

ft.	in.	ft.	in.	
2	11	9		
		4		
		3	1	11 Frame as before.
2	2	6	5	0 Oak sill as before.
2	2	6	5	0 Galvanised iron tongue and grooves, &c., as before.
				2 Frames as before, bedded and pointed.
2	2	1		Deal moulded casements hung on
	3	8	15	3 butts.
		2		2 Pairs 3in. brass butts.
		2		2 Tonks' wedge fasteners.
		2		2 Do. stays.
2	1	3		
	3	5	8	7 Hartley's glass as before.
		2		2 Frames, 4 oils white.
		2		2 Do. S. S. and varnish.
2		8		16 Small squares 4 oils white.
		16		16 Do. S. S. and varnish.
2	12	3		
		4½	9	2 Deal moulded grounds as before.
2	12	3	24	6 Architrave moulding as before.
2	4	3	8	6 1¼in. moulded window nosing as before.
		4		4 Rounded ends.
2	4	3	8	6 Deal moulding under do.
		4		4 M. and returned moulded ends to do.
2	2	6	5	0 Groove in oak for window board.
2	12	3		
	1	0	24	6 S. S. and varnish on architrave, &c.
2	4	3		
	1	6	12	9 Add on window board.
2	2	7		
	4	3	22	0 1½ B. ddt. in mortar.
2	4	8		
	4	0	37	4 Ddt. extra to facings as before.
2	4	11		Ddt. R. F. and S. walls, and twice dis-
	4	2	41	0 temper as before.
2	6	5		
		6		
		4½	2	5 Fir lintel.
2	6	5	12	10 Extra to rough arch over lintel, 4½in. soffit as before.
		12		12 Wood fixing slips.

WINDOWS AT SIDE OF PORCH ENTRANCES.

ft.	in.	ft.	in.	
2	8	7		
		4		
		3	1	5 Fir wrot. framed frame as before.
2	2	5	4	10 5in. by 2¾in. oak wrot. framed grooved, &c., sill.
2	2	5	4	10 Galvanised-iron tongue, and grooves in oak and stone and white lead, and bedding sill in white lead.
		2		2 Frames bedded and pointed.
2	2	1		2in. deal moulded casements as before,
	2	6	10	5 hung on butts.
		2		2 Pairs 3in. butts.
		2		2 Tonk's brass casement wedge fastngs.
		2		2 Do. stays.
		2		2 Elsley's patent openers.
	2	0	2	
	2	6	10	0 Hartley's glass as before in small squares.
		2		2 Frames 4 oils white.
		2		2 Do. S. S. and varnish.
		18		18 Squares 4 oils white.
		18		18 Do. S. S. and varnish.
2	9	1	18	2 3in. architrave moulding as before.
2	3	1	6	2 3in. by 1¼in. wrought, rounded, and tongued window board as before.
		4		4 Mitred and returned rounded ends to window board.
2	3	1	6	2 Deal moulding out of 2¼in. by 2in., planted on under same.
		4		4 M. and returned moulded ends.
2	2	5	4	10 Groove in oak for window board.
2	2	3	4	6 Smith's patent water bar.
2	9	1		
		6	9	1 Size, stain, and twice varnish on 3in. architrave.
2	3	1		
	1	0	6	2 Add on window nosing, &c.
2	2	3		
	2	7	11	7 Ddt. 1½ B. in mortar.
2	3	5		
	2	6	16	1 Ddt. extra to Kentish rag facings as before.
2	2	11		Ddt. extra to fair face, and twice dis-
	2	10	16	7 temper an approved tint.
2	2	7		Extra to neatly-axed arches in stocks
		9	3	11 in 2 rings in cement.
2	2	1		
		4½	1	6 Add soffit.
2	2	1	4	2 Turning piece 4½in. soffit.
4		9	3	0 Fair cutting in stocks.
2	2	7		Rake out cement joints and point in
		9	3	10 mortar.
		12		12 Wood fixing slips.

BORROWED LIGHTS.

	2	6		2in. moulded fixed sash in small
	3	0	7	6 squares with stout bars.
12		9		
		9	6	9 Glass as before in small squares.
	9	0		1½in. deal wrot. and rebated linings,
		7	4	6 tongued at angles.
	4	0		1¼in. wrot. and rounded window
		8	2	8 board.
		2		2 Notchings.
		2		2 Mitred and returned rounded ends.
	4	0		Deal moulding under window board
		2		2 planted on.
	10	0		2 M. and returned moulded ends to do.
	9	0		Deal grounds as before, one side only.
	10	6	10	6 Groove for plaster the other.
		2		2 3in. architrave moulding as before one side.
	9	0		Sash in 12 small squares, S. S. and
	10		7	6 varnish as before.
	4	0		
	10		3	4 S. S. and twice varnish.
	4	0		
		4	1	4 Add on window board.
2	2	6		Add on moulding.
	3	0	15	0 Ddt. L. P. float and set, and twice distemper partitions.

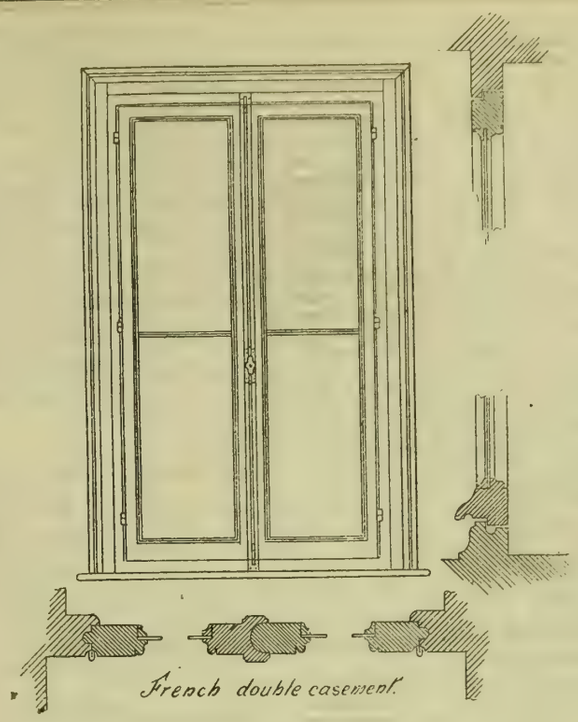
STAIRS.

24	3	9		1½in. deal wrot. treads with rounded
	1	6	135	0 nosing and 1in. risers tongued together, glued, blocked, and bracketed on, and including strong fir carriages.
	3	9		1½in. deal wrot. and cross-tongued
	3	9	14	0 landing and strong bearers.
2	3	9		
		7	4	4 1in. wrot. and tongued risers.
2	3	9	7	6 1½ deal rounded nosing tongued on.
		6		6 Notchings.
		4		4 Ends risers housed to strings.
		48		48 Ends, treads with rounded nosings and risers housed to strings.
	15	3		
	8	6	23	9 } 1½in. deal wrot. and beaded wall strings, and S. S. and twice varnish.
		2		2 Fair beaded end.
		3		3 Extra to ramps.
		2		2 Heading joints cross tongued.
2	3	9	7	6 1½in. deal skirting to match wall string on landing, and S. S. and twice varnish.
		1		Tongued and mitred angle.
	15	3		
	8	6	23	9 } 1½in. deal wrot. framed and beaded outer string, and S. S. and twice varnish.
	15	3		
	8	6	23	9 } 2in. by 2in. deal wrot. and moulded capping rebated on, and S. S. and twice varnish.
		4		4 Ends housed.
2	4	2	8	4 4in. by 4in. fir wrot. and framed newel, and S. S. and varnish.
		2		2 Ends stubbed to floor.
2	5	8	11	4 Add newel, and S. S. and twice varnish.
		2		2 Turned pendant 12in. long.
		12		12 Extra to forming chamfered panels on newels 2ft. 1in. by 2½in.
		3		3 Add do. do.
	15	3		
	8	6		} 4in. by 9½in. oak framed and moulded handrail, including joints and screws.
	8	6	32	3

N.B.—All oak French polished.

	ft. in.	ft. in.			
14					
7	2 2 10	119	0		1½in. deal wrot. all round and framed, one end to oak the other to deal balusters, and S. S. and twice varnish.
14	2 10	39	8		Add do. and do. on landing.
	15 3	57	2		L. P. F. and set, soffit of stairs and twice whiten.
	3 9				
	3 9	14	0		Add landing.
	8 6				
	3 9	31	10		Add other stairs.
	15 3				Quirk in p'aster.
	8 6	23	9		
					DOORS.
2	3 8				2¼in. door, the lower part in four
	7 1	51	11		panels, moulded both sides, the upper part sashed with stout bars in small squares with elliptical corners.
2	3 4	6	8		Moulding out of 3in. by 1½in. planted on.
	4	4			Mitred and returned moulded ends to do.
2	1½				Pairs 4in. wrought-iron butt hinges.
	2	2			6in. mortice locks and brass furniture on both sides.
	2	2			9in. iron barrel bolts.
21	9				Glass as before in small squares and
	9	13	6		glazing.
4	6	2	0		Cir. cutting and risk.
2	20 2	40	4		4in. by 4in. fir wrot. framed, rebated, beaded, and moulded frame.
	4	4			Iron dowels and mortises in fir, and York stone.
	2	2			Large frames bedded and pointed.
	12	12			Wood fixing slips.
	19 8	19	8		3in. moulded architrave on frame.
					N.B.—The walls of entrances shown plastered on detail to be finished fair face and twice distempered.
2	4 2				
	7 4	61	1		4 oils on door.
2	3 0				
	2 2	13	0		Ddt. where class.
	24	24			Small squares 4 oils white one side.
2	19 2	38	4		4 oils on frame one side.
2	4 2				
	7 4	61	1		S. S. and twice varnish on door.
2	3 2				
	2 2	13	8		Ddt. where glass.
	24	24			Small squares S. S. and twice varnish one side.
2	19 6				
	6	19	6		S. S. and twice varnish on architrave.
2	3 9				
	7 0	52	6		1 B. ddt. in mortar.
2	4 2				
	7 3	60	5		½ B. ddt. in mortar.
2	5 9				
	9 0	104	6		Ddt. extra to rag facings as before.
2	4 7	9	2		17in. by 6in. Scotgate ash stone, rubbed top and face step.
	4	4			Fair rubbed ends.
	4	4			Ends housed to Bath stone.
2	4 9				
	9	7	2		Neatly axed arch in cement as before.
2	4 3				
	4½	3	3		Add soffit.
2	4 3	8	6		Turning piece 4½in. soffit.
4	9	3	0		Fair cutting in stocks.
2	4 9				Rake out cement joints and point with
	9	7	2		mortar.
					W.C. DOORS (GIRLS' AND BOYS').
6	2 6				
	6 8	100	0		1in. proper ledged and beaded doors.
	6	6			Pairs 18in. strong cross garnets.
	6	6			Norfolk latches.
6	17 4	104	0		4½in. by 3in. fir wrot. framed rebated and beaded frame.
	12	12			Iron dowels and mortises, and tile and concrete paving.
	6	6			Frames bedded and pointed both sides.
	6 6	36			Wood fixing slips as before.
	6 3	18			Perforations in 1in. ledged doors for ventilators.
12	3 0				
	7 0	252	0		S. S. and varnish as before on doors.
12	16 10	202	0		Do. on frame one side.
6	3 4				
	6 11	138	4		Ddt. half brick wall in cement.
12	3 10				Extra to neatly axed arch in cement
	9	34	6		as before.
6	3 4				
	4½	7	6		Add soffit.
6	3 4	20	0		Turning piece 4½in. soffit.
24	9	18	0		Fair cutting in facings.
12	3 4				Ddt. extra to fair face and twice dis-
	6 11	276	8		temper.

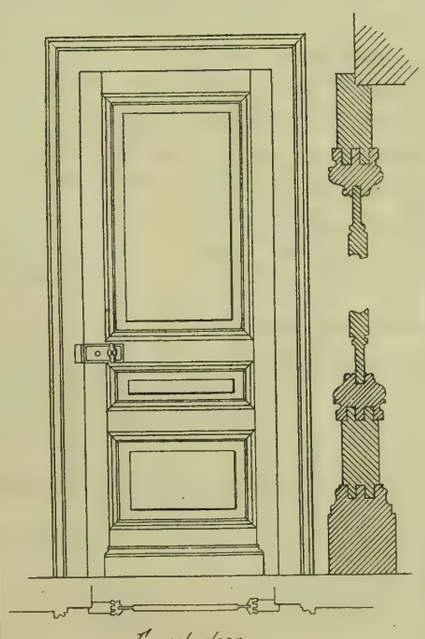
A new Primitive Methodist Chapel, situate in the main street at Northallerton, which has been erected at a cost of £1,500, was opened on Friday. The chapel is Queen Anne in style. Sitting accommodation is provided for 300 people, while adjoining is a schoolroom to accommodate 200, and class and vestry rooms. The architect is Mr. Macara, of Darlington.



French double casement.

SOME FRENCH BUILDING TRADES.

IN the Building News of Nov. 1st you gave some very interesting extracts from the volume of reports of the English trade delegates at the late Paris Exhibition. I have not yet seen the whole of the reports; I am sure, however, that they must form an interesting series to all in any way connected with the different trades. If you will allow me to take up a little of your valuable space, I should like to give you a short description of the mode of working and prices, &c., in the Department of the North of France, hoping that it might be interesting to your readers to compare the differences between Paris and the provinces as with London and the English provinces in regard to the few trades referred to in your extracts. The report says that "Bricklayers in Paris are not of a regular standing." This, of course, is not surprising, taking into consideration the very small percentage of brick buildings compared with stone; the mason combines the trade with the laying of stone, placing all the brickwork that may be required in the walls. I have noticed, however, that in the few buildings that are of brick, such as commercial schools, &c., glazed and coloured brick being often used; the walls are well and solidly built, the bricks properly laid, and the joints neatly struck, bricklayers from the northern provinces being generally employed in these cases. The men who make chimney-stack building a speciality are remarkably quick and good workers; specimens of the work were to be seen near the Machine Gallery at the Exhibition. Having occasion to visit this part of the grounds several times during construction, I was surprised at the rapidity with which the stacks were built, in one or two cases with an intricate pattern in coloured brick, the work being solid and remarkably straight.



French door.

Towards the Northern Department of France, where brick is very largely employed, the bricklayer has a recognised standing; the "maçon" building brick and "meulière" or rough stone walls. Then comes the bricklayer proper, and afterwards the "poseur de pierres" (mason), confining himself specially to cut block stone. The bricklayer receives from 4½d. to 5d. per hour—very often piecework is done; this trade receiving about 4f. 50c. a day. The mason generally works by the day, earning from 6f. to 8f. per average day of 10 hours. Hollow bricks are extensively used both in walls and partitions; duty has to be paid on the weight of the bricks before they can be introduced into the towns. The size of these bricks is 8½in. by 4in. by 2½in.

The carpenter earns from 4½d. to 5d. per hour, with 10 hours per day. Towards the North the carpenter has more general work to do than at Paris; in the city, floors and often roofs are constructed almost wholly of iron and concrete, whilst in the provinces timber holds its own, floors being constructed very similar to the English work.

The former is employed both by the hour and "à marchandage" or bargained work, arranged with the employer; the latter system more frequently. If by the hour, he earns from 4½d. to 5d., or about 5f. per day.

I cannot agree that construction is overlooked. The work is solid and often very scientifically put together; the wood employed is generally well seasoned. I have rarely seen a door or window that did not work well, or was warped or shrunk in any degree. As regards internal doors they are generally about 7ft. 4in. high by 2ft. 9in. wide, with two large panels and one narrow one, occupying the place of the English middle rail. The stiles and rails are 3in. to 3½in. by 1½in. thick, the mouldings being sometimes worked into the stiles and rails, though often they are bradded on, as in the English door. In superior doors the mouldings are worked out of the solid, ploughed on one side for the panel, and having two grooves on the back to fit on to the stiles, thus forming a substantial, though more costly,

door. In the section given, it will be seen that the plinth below the bottom rail has mouldings worked on, and also two grooves to fit on to bottom rail. This plinth is an essential feature in French doors. In nearly every case the stiles, top and bottom rails, are rebated, closing against fillets on the jamb and architrave, the door when closed allowing very little draught to pass. In the case of double doors, the closing stiles are rebated, with moulded fillets screwed on, forming a good closing joint. The window casements are well made, and allow very little draught to pass; as may be seen from the plan, the centre vertical joint is rounded on one stile and hollowed on the other. Sometimes the fillets are placed both inside and outside the hollow stile, though often only on the outer side, the hollow being worked out of the fillet and stile combined. The mouldings, generally small, are worked on the stiles (the latter being 3in. wide by 2in. thick). The hanging stiles are formed with a projecting bead, fitting into a corresponding hollow in the jambs, the latter having also a protecting rounded fillet on the outer side. The bottom joint has a throated weather-piece screwed on to the rail, just clearing the weather-bar on the sill. These casements open inwards, are very solid, and allow no appreciable draught or wet to pass.

Plasterers are paid by the hour or day, earning about 4·50f. per average day of ten hours. They show themselves very skilful and quick; when fine or decorative work has to be done, they can be thoroughly trusted to do it well and artistically.

The sculptors in stone form a very strong body of men, and can generally command a good price, some of them rising very high in their profession. The sculptor often confines himself to one particular branch, devoting himself perhaps to figure subjects, whilst another makes leaves and flowers his speciality. The Communal evening classes for drawing and sculpture modelling, &c., free to all, do much towards making artistic workmen, who work with feeling, and not merely like copying machines. These classes are always very well attended, especially during the winter months. The stone-carver earns from 10f. to 12f. per day of eight or ten hours. Piecework is greatly in vogue, the men preferring this mode of payment.

A trade little known in England is that of the "ravalleur." The stone employed in France is generally soft-working stone, hardening rapidly when exposed to the air. The blocks are bedded, rough cut, and squared, with proper projections for the intended mouldings, sculpture, &c. When the construction is finished, it is the "ravalleur's" turn to set to and work the building into form, paring the stone, working all the mouldings, and cutting the projecting blocks into shape for the sculptors. This trade is paid generally by the "tâche" or piecework, earning 5f. 50c. a day. As the stone is often unnecessarily large for the mouldings, &c. (studied after the construction is finished), careful work is needed in the use of the small pickaxe employed in cutting away just the amount of superfluous stone.

Plumbers earn about 5½d. an hour. They are, naturally, not so clever in sanitary arrangements as their more favoured brethren at Paris. As regards ordinary work, it is done carefully and conscientiously. The sanitary appliances, w.c.'s, &c., in ordinary houses are by no means as good as they might be. In the moderate-sized houses the w.c.'s are not often found on the floors, a corner of the small yard being devoted to the purpose. Traps are rarely used, the soilpipe dipping directly to the drain leading to the "fosse" or cesspit, the latter being cleared weekly or fortnightly by means of steam exhaust pumps and air-tight vans. Flushing cisterns are not often employed, the dry cesspit system being preferred. But now such good work is being done in Paris by the introduction of English and American sanitary systems and appliances, no doubt it will extend to the provinces, altering for the better this state of things.

Of course, the wages of these different trades is considerably less than in the capital; but the cost of living is proportionately cheaper. On the average 5 francs a day the workman can live comfortably, the more so as his children generally work in one of the neighbouring factories, and thus help the family support. Work commences in summer time at five o'clock in the morning, the men generally taking a "gouter" or small glass of spirits costing one sou before work; at eight a half-hour is allowed for a breakfast of coffee and bread, costing about 2d. At twelve o'clock the men leave for dinner, resuming work at half-past one, to continue until five o'clock, when another half-hour is allowed for the afternoon "gouter"; this taken, work is resumed until half-past seven in summer. Then comes the evening meal, the "souper" or supper, about eight o'clock.

There are six fully working days in the week, Sunday being a free day, the municipal authorities forbidding work on this day, unless there is a pressing need to continue the same. On Monday, not much work is done. The superior men who work by the hour are allowed to make a short day, and leave work earlier; the ordinary workmen require sharp surveillance to keep them at their tasks, for as a result of the Sunday "amusements" they do not feel too industrious. In winter time the hours are reduced to ten per day, and then to eight, work commencing about seven o'clock, and continuing until dusk, the dinner hour being shortened, and the "gouter" discontinued.

The opinion in England seems to be that the French workman is an easy-going worker; this may be; certainly he does not generally rush slap-dash to his task, and when it is finished perhaps find it is all wrong; but he takes his time at considering, and when considered, goes ahead and works fast, the result being all the better for the previous consideration. There is no doubt that the artisans on both sides of the Channel might mutually learn a good deal from each other, if they would lay aside their prejudices and look clearly at each other's work impartially, culling the advantages and laying aside the defects.

; Arthur J. Vye Parminter.

Palais des Beaux Arts, Lille, Nov. 19.

THE SCHOOL BOARD SCANDAL.

WITH reference to the allegations of scamped builders' work in certain board schools, the London School Board received at its meeting yesterday (Thursday) a further long and fully detailed report from the Works Committee dealing with the two schools that have been specially named—those at Salter's-hill, Norwood, and Woodland-road. Inclosed was a report from the superior officer for repairs specifying the serious cracks and settlements in the former building, and the inferior quality of handiwork, Portland stone, plumbing and other materials in the latter list. Mr. F. Warren, who acted as clerk of works for the Woodland school, and for the enlargement of the Salter's-hill school, was asked for an explanation of the defects and divergences from specifications, and, in reply, said that as to Salter's-hill school he admitted that there was an error in judgment in building so closely to an old undisturbed drain, though the consequences had been long in appearing. He acted as he thought best at the time (four years ago), and, as he believed, with the full sanction of the architect. As to Woodland-road school, Mr. Warren urged that the fact that there was no settlement anywhere, although the building was of great height and carried on arches resting on heavy clay, was presumptive evidence that the materials and workmanship were not of inferior character. He admitted that some of the stone and bricks were not of best quality; but pleaded that when the school was in progress he had four schools simultaneously going on under his charge. The committee decided, however, to dispense with Mr. Warren's services, when he appealed against that action upon the following grounds:—

1. The work was approved, after personal inspection from time to time, as it went on by my superior officer, the architect.

2. It was subjected to thorough examination four months after completion by the Board officer designated for that purpose, and only trivial defects were noted.

3. The architect expressed his entire satisfaction when the work was completed, which could not have been the case had flaws and imperfections on the eye-level been perceptible.

4. Having two other schools on hand at the same time at a considerable distance apart, it was impracticable to give all the attention required to avoid minor errors.

5. Previous to this I had had charge of some five schools, and since then three or four, and during the whole period some eight or nine additions. I have a claim to ask if any of these 16 or 17 works show evidence of neglect or culpable carelessness on my part.

6. During the eight years I have served the Board I have never had less than *two*, frequently *three*, and at times *four* jobs in hand at once. I gratefully acknowledge the confidence reposed in me by the late and present architects which this fact suggests; but I am not infallible nor ubiquitous, and the burden has at times been too much.

7. I claim that an error in judgment, or incidental relaxation of vigilance, the effect of which has been three or four years coming to the surface, should not be allowed to over-ride the record of service before and since.

8. More especially do I ask you to consider the last work upon which I have been engaged—Langford-road School. The Chairman himself, not long ago, came and congratulated me on the excellent work I had got there, a spontaneous testimony the more prized and cherished as he has set up a high ideal of perfection at which to aim in schoolbuilding. Since then two separate builders have been referred by the architect to this building as a sample of what work ought to be. The cause is not far to seek. I have been able to devote to it an *undivided* attention.

The committee having considered this reply and the amended report of the superior officer of repairs, decided to discontinue the services of Mr. Warren, *pour encourager les autres*, and notified the Board to that effect.

A detailed report was received from the superior officer for repairs as to the Tower-street School, Finsbury, in which defects were shown to exist in the drainage and plumbing, and the committee recommended that £150 be voted for immediate repairs to this building.

CHIPS.

Warrant was granted at the Edinburgh Dean of Guild Court on Friday to the city School Board to erect a school at Millerfield-place, Sciennes. The school, which will be the largest yet erected in Edinburgh, will afford accommodation for 1,518 scholars. In addition, provision will be made for a swimming bath and a gymnasium on the basement floor, and practical cookery and science rooms on the upper floor. The building and site will cost about £28,000. Mr. Robert Wilson, of Edinburgh, is the architect.

The sanctuary of the Roman Catholic church in Guild-street, Burton-on-Trent, was reopened last week after decoration, carried out, at a cost of £350, by Mr. J. Hopkins, of Abergavenny.

After having been closed for four weeks St. George's Church, St. George's Parade, Wolverhampton, was reopened on Sunday for Divine service by the Bishop of Shrewsbury. Several important alterations have been made, and over £300 have been spent; but to complete the whole of the alterations and improvements contemplated a sum of at least £800 will be needed. The scheme includes the removal of the organ from its present position to near the choir, and the reconstruction of the pews. The contractor is Mr. Willcock, and the architect Mr. F. T. Beck.

A new organ was opened in St. Andrew's Church, Walsall, on Sunday. It has been built by Messrs. Nicholson and Lord, of that town, at a cost of £400.

The name of Samuel Hurst, of Southport, architect and surveyor, appears in Friday's *Gazette* among the adjudications in bankruptcy.

The City Corporation accepted at the last meeting an oil painting of the late Mr. William Pitman, C.C., for many years an architect practising in Newgate-street, offered by his son and late partner, Mr. Walter Hayman Pitman.

At the invitation of Mr. Saul Isaac, the contractor for the newly-completed Stratford-on-Avon, Towcester, and Midland Junction Railway, a number of gentlemen left Euston on the 23rd ult., by special train, for the purpose of going over the new line. The saloon carriages were taken over the new line from Towcester to the junction with the Midland Railway, about one mile from Olney. After inspecting the whole of the works, for which purpose the company alighted at the two new stations *en route*, the party returned to Towcester. The line will give a direct communication from the West of England to Broom, thence to Stratford-on-Avon, Towcester, Olney, and London, *vid* Bedford, saving, between Bedford and Worcester, a distance of between 35 and 40 miles.

Further improvements have just been completed in the chancel of the parish church of Long Sutton. The south side has been enriched by three stone sedilia, fixed as a memorial of the late vicar. These were designed by Mr. W. Bassett Smith, of London, and carried out by Messrs. Cornish and Gaymer, of North Walsham. The seat is of polished Derbyshire stone. The rest of the work is of white Ancaster. Slender pillars, surmounted by carved angels, winged and clasping shields, support three ogee crocketed canopies, the apices of which terminate in poppy-heads. There is a great variety of pattern in the carving.

A memorial window, designed by Mr. Holliday, London, and executed by Messrs. Powell and Sons, London, has just been erected in the parish church, Dundee. The subject is "The Baptism of Christ."

At a council meeting of the Royal Institute of the Architects of Ireland, held on Monday, Mr. W. M. Mitchell in the chair, six members were passed for election, and it was decided to hold the annual meeting on the 14th inst., to be followed in the evening by a dinner at the Grosvenor Hotel.

Building Intelligence.

Accrington.—St. Andrew's Church Schools, in the Antley district, were opened on Nov. 28th. The plans for the completed scheme show a two-story building for the girls and boys respectively, with the infants' schoolroom and classrooms one story high, provision being made for about 800 pupils. The present erection comprises the infants' room, which will, in the first instance, be used as a mixed schoolroom, together with four classrooms, babies' room, and cloak-room. This portion will secure accommodation for 340 scholars at a cost of £1,700, exclusive of the site. The external walls are of stone, faced with Halifax straight-cut wallstones; the ashlar has been obtained from the Ringby quarries, and rubble stone from local firms. The style adopted is a free type of 16th-century character. The roofs are covered with Buttermere green slates. All the walls inside are finished in Portland cement to the height of the window-sills. The heating is effected by means of low-pressure hot-water pipes, and the ventilation by means of extract-tubes fitted with powerful gas sun-burners. The work has been carried out by local men under the direction of Mr. Henry Ross, of Accrington.

Bristol.—A block of buildings have been erected at the corner of Clare-street and St. Stephen's-avenue, for the Provident Life Insurance Company and the County Fire Office. Mr. E. Henry Edwards, of Bristol, was the architect, and Mr. A. J. Bevan, of Bedminster, the contractor. The building is of five stories, and is of Queen Anne style, very freely treated. In the basement there are three offices, and on the ground floor are the principal offices for the joint companies and rooms for the managers. On the first and second floors there are also offices, each having a bay window set in between the piers, and an oriel window is placed over the main entrance on the corner of the building. Upon the third floor are the caretaker's apartments, with kitchen, &c. The structure is built of freestone, with red Mansfield stone dressings; and in the upper portions there is some carving. The chimneys are of brick, with freestone bands, and the roof is of slate. All the floors of the building are of iron and concrete, over which are laid wooden blocks. Upon the floor, ceiling, and walls of the lobby, Doulton's tiles are used. At the main entrance are a pair of wrought-iron gates, supplied by Messrs. Jones and Willis. The stained glass is by Mr. Alfred O. Hemming, of Margaret-street, London. The carving has been executed by Mr. J. P. Steele, of Kingsdown. On the second-floor level, and projecting over Clare-street, is a wrought-iron swing-sign, supported by ornamental ironwork.

Edinburgh.—In the course of the morning service on Sunday the Rev. Dr. MacGregor made a statement as to the rebuilding of St. Cuthbert's parish church. For various reasons, but more especially as a consequence of the examination of the air in the church by Dr. Hunter Stewart, Demonstrator of Public Health in the University of Edinburgh, revealing a dreadful condition of things, it had been resolved to do away, if possible, with the upper gallery. On the 18th February last plans of the church with only one gallery were submitted to a very full meeting of session, and carefully explained by the architect. The session were assured that the total outside cost, including architect's and other fees and contingencies, would amount to £14,140, which sum had been already realised. When, however, the working plans were measured and put into the hands of contractors, it was found that, partly owing to the rise in prices and other causes, the very lowest prices offered by contractors far exceeded the sum he had named. But through the exertions of the sub-committee, and mainly of Sir James Gowans, in concert with the architect and the measurer, by leaving out the two east towers, and by simplifying many of the details, without interfering with the general outline or effect, the cost had been reduced to the outside figure of £17,000, leaving £3,000 for the kirk-session still to raise. The kirk-session had now unanimously agreed to request the architect to prepare the modified plans with the utmost despatch, and put them into the hands of the measurer, and after measurement, into the hands of the contractors who contracted for the previous plans. Under the modified plans the church would be entirely new except the spire.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Birmingham Architectural Association.—A meeting of the Birmingham Architectural Association was held on Tuesday, December 3rd, at which a paper entitled "The Decorative Treatment of Architectural Ironwork" was read by Mr. C. J. Hart, in which, after laying down as the principles which govern all designs for ironwork, that they should be consistent with the metal as well as with the purpose for which they were intended, that no feature should leave a doubt as to whether it was designed for cast or wrought iron, the ornament should be subservient to the construction, and that attention should be paid to the distance at which the object was to be placed from the eye, Mr. Hart pointed out that at the present day craving after variety was often gratified at the expense of fitness. He then dealt in an exhaustive manner with the history of wrought ironwork as shown in the specimens still remaining with the architectural treatment.

Civil and Mechanical Engineers' Society.—The first ordinary meeting of the Civil and Mechanical Engineers' Society for the new session was held at the Westminster Palace Hotel on Wednesday evening, December 4th, when Mr. Henry Adams, M.Inst.C.E., professor of engineering at the City of London College, delivered his opening address. After alluding to the responsibilities which the presidential chair involved, he reviewed the work of the Society during the past year, indicating the chief points of merit in the papers which have been read, and using each as the text for some practical remarks. With regard to technical education, he laid down the qualifications for good engineering draughtsmen, and said that, although the supply was commonly thought to be greater than the demand, every engineer at times found considerable difficulty in getting competent assistants.

Edinburgh Architectural Association.—The session of this Association was opened on the 28th ult. by Mr. W. M. Conway, M.A., the honorary secretary of the National Association for the Advancement of Art, with a lecture on "Ancient Egyptian Architecture." Professor Baldwin Brown, the president, occupied the chair. The lecture consisted of a series of comments on an interesting number of lantern views, chiefly of Egyptian temples of the ancient, middle, and new empires, and the period of the Ptolemies. Mr. Conway called attention to the method of construction in tombs, which offered an indication of the general principles of Egyption building. The walls were made up of slabs laid one upon another, and in the interior there were columns, upon which were placed monoliths for the formation of the roof. Alluding to the Pyramids, Mr. Conway expressed the opinion that the term architecture could not be applied to any of these erections—they could only be regarded as examples of building. Mr. Conway proceeded to show the development of the column and capital, first in wood and metal and then in stone, the basis of the open flower and the closed bud being noticeable as the ornamentation. He thereafter explained the leading features of a number of the temples. The temple of Elephantos, which had been reported upon by a staff of explorers under the instruction of Napoleon, was one of the best specimens of purely Egyptian architecture of the earliest time of the new empire. Unfortunately some Turkish pasha thought that the stones of this temple would do very well for his purposes for a house, and he accordingly knocked the temple down. The whole appearance of the structure was simple, the effect was harmonious, and the decoration was entirely suitable. Amongst the other views were the temple of the Church of the North near Thebes, the temple of Luxor, and the great temple of Ebfoo. The chief matter of comment with reference to these was their characteristic of ponderous style in the interior, owing to the predominance of columns; and subsequently Mr. Conway spoke of the interior ruins as "an organised quarry."

Manchester Architectural Association.—The third ordinary meeting was held on the 3rd inst. at the Diocesan Buildings. Mr. W. H. Bidlake, M.A., read a paper on "Dry Rot: a Botanical Contribution to Architecture." He prefaced his remarks by a scientific description of the growth of trees. The germs are often transmitted to sound timber by the tools which have been used on infected wood, and remain dormant until favourable conditions bring them into activity.

COMPETITIONS.

Yeovil Town Hall.—At a meeting on Monday of the town council, a letter was read from Mr. Johnson, architect, whose design for a new Town Hall was recently accepted, out of 16 competitors, thanking the council for awarding him the premium (£10 10s.) for his design, and expressing a hope that the work would be commenced forthwith. It was decided to ask Mr. Johnson to meet the council in reference to the building.

CHIPS.

The Maidstone town council proceeded on Wednesday week to elect a borough surveyor; 144 candidates presented themselves, the salary offered being £250 a year. Mr. W. D. Scoones, of Beckenham, was appointed; Mr. Dryland, of Deal, being placed second in the final voting.

The Bishop of Ripon consecrated, on Saturday, the new church of St. Andrew, at Starbeck, near Harrogate. The church is Early English in style and is seated for 210 people. East of the church is a schoolroom, 50ft. by 20ft. The cost has been £1,850. Mr. Sheard was the honorary architect, and Mr. Hobson the clerk of works.

One of the great windows of the south transept of Gloucester Cathedral has just been filled with stained glass as a memorial to the late Mr. T. Gambier Parry, of Higham Court. The window represents "the religious service of the fine arts." The four principal lights are filled with figures of St. Barbara, the patron saint of architects, St. Luke, of painters; Abbot Seabrook, who built the great central tower of Gloucester; and Fra Angelico. The top tier of lights contain a row of singing angels. Beneath the figures is a row of panels showing artists at work at painting, sculpture, and architecture.

The plans of Mr. R. Knill Freeman, of Bolton and Manchester, have been accepted for the new church of St. Jude's, which is to be erected in the northern part of St. Paul's parish, Preston. The estimated cost is about £6,000.

Two huge sculptured granite pieces have been added in the large saloon on the west side of the British Museum. The piece on the right on entering the gallery consists of a seated figure, inscribed with the names of Osorkon II., about 830 B.C.; and opposite stands a column, almost in perfect condition, about 17ft. high by 3ft. in diameter, also inscribed with the name of Osorkon II. and titles of Rameses II., about 1330 B.C. The sculptures were found at Bubastis, and presented to the nation by the Egypt Exploration Fund.

The Western Schools, North Shields, are warmed and ventilated by means of Shorland's patent Manchester stoves, supplied by Mr. E. H. Shorland, of Manchester.

The rural sanitary authority of Leighton Buzzard, at their meeting held last Friday, unanimously resolved to call in Mr. Nicholson Lailey to advise on a water supply and sewage disposal works for their town.

It is said to be the intention of her Majesty's Government to consolidate all the Acts of Parliament dealing with the Housing of the Working Classes into one Bill, in order to facilitate their application by local authorities. The work of consolidation is at present being carried out, and it is hoped that it will be finished before the opening of Parliament.

The improvement commissioners of Rhyl received on Monday a report from Mr. Scoones, C.E., of Bristol, as to the foreshore improvements. Mr. Scoones recommended the formation of a lake on the foreshore, the erection of a sea front wall, the formation of a series of lawns, inclosures and shelters, the asphalting of the promenade, and the extension of same in an easterly and westerly direction, the construction of a sea-water reservoir for street flushing purposes, the prevention of sand drift, the acquisition by the town of the present Promenade Pier, and the extension of the same. The cost of the whole of these improvements he estimated at about £40,000. It was resolved that the report be printed and its consideration deferred to a special meeting of the board.

Mr. F. W. Keighley has been elected assistant surveyor to the Birkdale local board from over one hundred candidates.

The City Council of Birmingham decided on Tuesday to carry out the fittings of the new Victoria Assize Courts, now in course of erection from the plans of Messrs. Ingress Bell and Aston Webb, in oak instead of pitchpine, at an additional cost of £2,642.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. PASSMORE EDWARDS.

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ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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SITUATIONS.

The charge for advertisements for "Situations Vacant or "Situations Wanted" is ONE SHILLING for TWENTY-FOUR WORDS, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Dr. Jekyll," "Tyne," "Scott," "Lord G."

F. T. A. (The Sexton's House "adjoining" the chapel means, of course, that it abuts on to the main building.)—THE RED ROVER. (See last answer; there is to be no direct communication between the lodge and the chapel. Had this been intended the conditions would have said so.)—FLORIDA, JONES AND BROWN.

P. Co.—T. T.—R. and E.—W. S. and Co.—A. G. N.—W. B. W. and Co.—W. H. S. and Co.—E. K.

Correspondence.

THE SCHOOL BOARD SCANDALS.

To the Editor of the BUILDING NEWS.

SIR,—It will be remembered that at the commencement of its career the Board instituted a number of competitions for school designs, inviting about half a dozen architects to enter each competition. By this means the ideas of most of the leading architects in London were gathered, and the idea now prevalent in the profession is that the competitions were an unfair means of obtaining the best ideas of school arrangement for the Board's own salaried architect to digest and use as his own. Personally, I do not think that Mr. Robson troubled himself to wade through the plans; he had ideas enough of his own, and thinks his own school *planning* very clever.

The result of these competitions was that in the early years of the Board a considerable number of schools were built under the direction of outside architects, men practising generally in the profession. These men, who were successful in the competitions, were in most cases of too full practice to have competed for a single school. Their delusive idea was that, if they were successful in one competition, they would have had at least six other schools placed in their hands. But they were disappointed; no sooner was every available idea on school planning thus illustrated, than the Board set up their own architects' department, with Mr. Robson as a salaried chief, and a staff of sub-architects and draughtsmen—with what result we now all know. Then they built at such a furious rate that although it is possible Mr. Robson may have seen once or twice all his schools, it is scarcely probable, considering that he frequently had, in addition to the work of designing his buildings, to attend many committee and board meetings each day for several consecutive days in each week.

The point of interest in all this is that although almost every one of the schools erected under the direction of the Board's salaried architectural staff have been found to be grossly defective, it does not appear that those schools built by architects in the usual professional way have been found to have any serious fault. This circumstance is to the credit of those gentlemen, and should receive some notice.—I am, &c.,

ONE WHO KNOWS A GOOD DEAL ABOUT IT.

Intercommunication.

QUESTIONS.

[10162.]—**Blackmailing.**—Is there any use or custom of the trade which allows an architect to claim commission on contractors' accounts over and above the usual commission on total cost of the building upon which he is employed? The case is this. A school board employed an architect to enlarge their school premises. They accept his plans and estimates, and he proceeds with the work. The board now find that the architect is trying to obtain a commission from each of the contractors upon the materials supplied by them, and the board of course resist this, as the said accounts will be increased to them. Can the board refuse to pay architect or contractor? If not, what is the remedy for such an attempt at blackmailing?—N. J. FLEMING.

[10163.]—**Corrosion in Iron Pipes.**—Having within the last twelve months laid a 3in. iron pipe for a supply to a gentleman's house, which in so short a time has become completely corroded up, I should value a practical opinion as to the relative value or advisability of using either galvanised piping or cast iron (of a larger diameter, of course, as to the latter) under such circumstances. The water is declared "a first-class water" by the county analyst, who gives the analysis as follows:—

Appearance in tube—like distilled water.	
Total solids at 212 F.	13·5 grains to gallon.
,, after ignition	10·5 ,, ,,
Chlorine	1·5 ,, ,,
Oxygen recognised for 15 minutes.	·029 ,, ,,
,, ,, ,, 3 hours	·050 ,, ,,
Free ammonia	Nil in one million
Albumenoid ammonia	·03 ,, ,,

Pressure at junction with company's main about 12ft.—PROVINCIAL BUILDER.

[10164.]—**Church Decoration, Distempering, &c.**—What is the best method for stopping old plastered walls from turning spotty after being distempered? also, to prevent the distemper, after being on some months, turning quite to a kind of mildew in places, in others turning to a flaky or scaly surface, and then brushing or scaling off, as the case may be? Three things present themselves to me as causes:—1st. The action of the lime in the mortar which may be stronger in one place than in another; 2nd. Being in the Eastern Counties and near the sea, sand may have been used of a salty nature, and may have a tendency to turn damp; 3rd. The walls very often being faced with flints or built with flints as rubble work, turning moist as flints do with the action of the weather. One great difficulty is, before cleaning off the old whitewash or colouring, these places are not noticed. The walls are bad and dirty and are therefore not observed; but as soon as you clean off fresh distemper, and get away, the work being fresh done, every defect is noticeable.—REMEDY.

[10165.]—**Mortar Freezing—Petroleum.**—I have heard that petroleum oil mixed with water will prevent its becoming frozen, or will, at any rate, lower the freezing point. Is this so? Will any reader favour me with his experience? What quantity should be used? The question is important in view of a probable hard winter, and considering the present cheap price of petroleum.—W.

[10166.]—**Water Supply.**—Will some kind reader mention a reliable "table for calculating the flow of water through pipes of any diameter and at any hydraulic inclination?"—A.

[10167.]—**Charges for Quantities.**—How is the commission for preparing quantities made up—viz., how much for "taking off," "abstracting," and "billing," respectively? and what would be a fair commission on small work, up to, say, £500? Can an extra charge be made for writing specification for the architect, who has not time to do so?—FINCH.

On Sunday there were dedicated three windows, placed in the morning chapel of this church, in memory of Dr. W. S. Wilson, late Bishop of Glasgow and Galloway, and for 52 years incumbent of Holy Trinity. The windows were painted by Messrs. A. O. Hemming and Co., London, and illustrate the history of the Church in Scotland from the times of St. Ninian (first Bishop of Galloway) and St. Kentigern (first Bishop of Glasgow) to the time of the late Bishop himself.

The name of William Youlten, late of Great James-street, Bedford-row, now of Finsbury-square, City, architect and surveyor, appears in Tuesday's list of Receiving Orders in the *Gazette*.

LEGAL INTELLIGENCE.

RE W. H. GIBBS.—A meeting was held on the 21st ult., at the London Court of Bankruptcy, before Mr. Registrar Hazlitt, for public examination under the extensive failure of William Henry Gibbs, who has traded as a builder and contractor at West Kensington and Fulham. The accounts showed gross liabilities to the amount of £608,403, of which, however, not more than £13,941 are expected to rank, and an estimated surplus in assets of £3,161. In 1876 the debtor commenced business at the Cedars Estate, West Kensington, and at Fulham, in partnership with J. P. Flew, as builders, and they traded successfully until 1882, when the partnership expired. The capital of the firm then amounted, it is stated, to about £100,000, and the business was converted into a limited company—Gibbs and Flew (Limited)—the name being subsequently changed to the "West Kensington Estates Company (Limited)," each partner receiving fully paid-up shares for £30,000, and being appointed as managing directors. The company went into liquidation in 1885, after which the debtor and Flew were engaged jointly till June, 1887, on realising the remaining properties and completing houses for the company and mortgagees. Creditors appearing as fully secured (£212,756) are stated to be principally mortgagees (in possession) of leasehold and freehold house properties and building estates, which are estimated to yield a surplus more than sufficient to satisfy the unsecured liabilities. The late partner. J. P. Flew, was adjudged bankrupt in August, 1888, and has obtained his discharge. The bankrupt, examined by Mr. Howell, said that in June, 1885, the West Kensington Estates Company (Limited) was constituted, the business having been previously carried on under the style of Gibbs and Flew (Limited). The liquidation of the affairs of the West Kensington Estates Company (Limited) came upon him by surprise. He endeavoured to keep the company afloat, and found moneys for the purpose. The examination was concluded.

HOUSES THAT "COULD BE DEMOLISHED WITH A TOOTHPICK."—At Wandsworth police-court on Saturday, Mr. Biron, Q.C., heard a summons against George Edwards, a builder, for constructing three houses at Wimbledon without providing a proper concrete foundation. The summons was taken out by Mr. Whitfield on behalf of the Wimbledon Local Board, and he called witnesses to prove that the foundations consisted of mud and ashes, and that there was nothing to prevent the damp from penetrating the floors. The surveyor to the Board produced a piece of concrete resembling marble to explain what the foundations should really consist of, but Mr. Biron said that was more suitable for stone decorations. The surveyor never saw a house of two stories built on concrete such as that. A solicitor, who represented the defendant, said the freeholder was perfectly satisfied with the character of the foundations. Mr. Biron decided that it was impossible to come to a decision without a personal inspection, and accordingly the magistrate, accompanied by the clerk, visited the houses, where he was met by all parties concerned. Mr. Biron, after making an examination, expressed his surprise at the construction of the buildings, which, he said, could easily be demolished with the aid of a toothpick. He decided against the defendant, and adjourned the summons to enable him to comply with the Act and insert proper foundations.

NEGLECTING TO GIVE NOTICE. — (Smallpiece, District Surveyor, v. Grover and Son, Builders.)—On the 27th of November, Mr. de Rutzen, the magistrate at Marylebone Police-court, gave judgment in this case, which had been postponed to allow him to inspect the work done—viz., the underpinning of a flight of steps leading to the front door of 90, King Henry's-road, and the rebuilding of the pier at the foot of the steps. The district surveyor's clerk saw a bricklayer rebuilding the pier, gleaned from him what had been done, and thereupon threatened to summon the builders for not giving notice. The builders replied, expressing their surprise that a district surveyor should claim notice for such a trifling job, and pointing out that a flight of steps was not a building. Several letters followed, and, as the builders refused to give notice, an account dated 14th October was sent in by the district surveyor for surveying structural repairs, £1 10s., by-law fee, 5s.; and on the 16th October a summons for omitting to give notice was obtained returnable on the 23rd of that month. The builders were defended by Mr. Jackson, solicitor, who argued that a flight of steps was not a building, and that if the magistrate decided that it was, still the work done was only a necessary repair due to a settlement, and cited the case of "Den v. Badger and others" in support of his case. The district surveyor contended that the space under the steps being used as a coal cellar made it a building, and claimed that two or three courses of brickwork under a cucumber frame made it a building, for which he was entitled to have notice and a fee. At the request of the builders' solicitor, the learned magistrate adjourned the case for 14 days. In the interval he met the district surveyor

and Mr. Hamilton (the builders' surveyor), and inspected the work that had been done. On the 27th he gave judgment in favour of the builders, saying that he considered the case on all fours with "Den v. Badger," and that he agreed with the views expressed in that case by the Lord Chief Justice, that it would be intolerable if for every trifling repair the public had to pay a district surveyor's fee. As there had been so many contrary decisions, he refused to allow costs.

Must Drains be Laid on Concrete?—At the West London Police-court on Friday Mr. Curtis-Bennett heard three adjourned summonses against Alfred Heaver, builder, for constructing drains to houses in Wandsworth Bridge-road and Rosebery-road contrary to the regulations of the Fulham Vestry. The summonses had been adjourned for an independent surveyor to examine the drains constructed by the defendant, in order that the magistrate might consider the question of costs. It appeared that the defendant alleged that in constructing the drains in question he had only followed the practice previously adopted at other houses—namely, of laying the pipes without a concrete bed, and that such work had been passed by the officials. The regulations of the vestry were, however, that the pipes should be laid in concrete. For the purpose of proving the truth of the defendant's statement the magistrate adjourned the summonses, and appointed another surveyor to examine the drains. Mr. Curtis-Bennett, in delivering judgment, said that when the defendant appeared before him on the first occasion he stated that he had laid the drains in a proper way. He also stated that he was laying the drains in the same way as he had done at other houses, where they were passed by the officials of the vestry, all without concrete cement. That statement was not denied nor admitted. It was only when a new inspector was appointed that it was found that the regulations had not been complied with. He appointed Mr. Knightley, district surveyor of Hammersmith, to examine the drains and report the result to him. He also requested him to give notice to both sides to be present. The magistrate then read a letter received from Mr. Knightley, stating that he had examined the drains of three houses, and none of them had been laid in concrete cement. The magistrate said it appeared that the statement of the defendant was perfectly true, and that he was following what had been done on previous occasions. The vestry was certainly not entitled to costs. He dismissed the summonses, and ordered the vestry to pay two guineas costs. Mr. Bassett Hopkins wished to offer an explanation on behalf of Mr. Norrington, surveyor to the vestry; but the magistrate declined to hear him, and said the surveyor was not before him. His remarks did not affect Mr. Norrington, but the case ought to be inquired into by the vestry. Mr. Bassett Hopkins said the drains were passed, but not inspected.

Reinstatement Case.—A. Dreyfus and Co. v. Hoare and Others.—(Before Mr. Baron Huddleston and a Special Jury.)—In this action, concluded on Nov. 26, the plaintiffs, a firm of contractors, sought to recover £514, as per an estimate dated September 16, 1886, which they alleged was due to them from the defendants under a contract of the same date, for work done and for £26 as extras, in connection with completing the restoration of St. Paul's Church, London Docks. It was admitted that the work was done. The defendants, who were a restoration committee, denied that there ever was a contract or estimate, and alleged that the work was agreed to be done by measurement, and that under these measurements they were only liable for £284 6s. 11d., and that sum they paid into court as sufficient. In course of the case the defendants were forced to admit a further liability of £38. Mr. Baron Huddleston, in summing up, told the jury that there was no doubt that the plaintiffs had done the work. The church, it appeared, had been injured by the flames from a fire which had occurred in its immediate neighbourhood, and required repair and refacing. Part of that work had been done by the plaintiffs, and paid for, prior to the work in question, which was for the completion of the restoration. The plaintiffs claimed to be paid £514 upon the basis of an alleged estimate of September 16, 1886. The defendants denied the existence of that estimate, and said they had never seen it, and alleged that the agreement was to pay for the work by superficial measurements at agreed prices furnished by the plaintiffs. It was admitted now that in any event the plaintiffs were entitled to £38 more than the money paid into court. The jury found a verdict in favour of the plaintiffs for £38 odd above the £284 odd paid into court. Mr. Baron Huddleston thereupon gave judgment for the defendants upon the issue that the work was to be paid by measurement and not contract; and for the plaintiffs upon all other issues, the plaintiffs to have general costs of the action. He also certified for a special jury.

The Middlesborough school board have adopted plans by Mr. Bottomley for new schools to be built in Grange-road in that town.

Our Office Table.

We regret to record the decease of Mr. James Duneau Doulton, which occurred at his residence at West Brighton, on Thursday, the 28th ult., after a lengthened illness. The late Mr. Doulton, who was in his 55th year, was the youngest son of the late Mr. John Doulton, the founder of the eminent firm of Doulton and Co., and brother to Sir Henry Doulton, the present head of the firm. He always took a most active part in the business, and being a man of genial character, and kind and considerate to all with whom he came in contact, his loss will be keenly felt by all the staff and employés. The funeral took place at Hove Cemetery on Tuesday last, and there were present Sir Henry Doulton, Mr. H. Lewis Doulton, Mr. Ronald D. Doulton, Mr. Jas. Doulton, Mr. Allan Doulton, Mr. Alfred Doulton, and many other relatives and friends. Large numbers also of the managers, travellers, clerks, foremen, and workmen from all the various establishments of the firm of Doulton and Co. were present, all being anxious to pay this last mark of respect to their late employer, and thus show not only the very high esteem in which they held his character, but also to testify to the strong personal attachment which they ever felt towards him, and their sympathy with the relatives.

Messrs. Illingworth, Ingham, and Co., of Leeds, London, Manchester, and Goole, have just issued a book of designs of Parquetry, in connection with which they draw special attention to the great advantages of their patents, which they claim give a greater degree of accuracy than many other methods. The parquetry is perfectly true, is finished (and, if required, wax-polished) at the factory, and laid complete on the joists in the building without any under-floor. As an illustration of the expedition with which the parquetry is laid, we are assured a floor of average size and shape can be completed by two men in one day, instead of from one to three weeks under the old system. The laying can be done by ordinary joiners; but Messrs. Illingworth, Ingham, and Co., are, if desired, prepared to include it in their estimates.

Messrs. West and Collier, of Hambleden, Henley-on-Thames, have just issued another edition of their useful illustrated catalogue of chairs for churches and domestic use. The moderate prices, sensible designs, and good workmanship of this firm have brought them into contact with most architects, but any who have not yet seen the catalogue should get a copy. Note especially the prices of some of the really good and cheap Early English rush-seated chairs, compared with the sums asked for imported foreign goods sold by flashy firms under fancy names.

CHIPS.

Improvements have been made in the ventilation of St. John's Institute, Boston Spa, Tadcaster, Kershaw's system having been applied.

Sir Arthur Blomfield, A.R.A., has been elected architect for the Church House, which is to be erected on an extensive site in Dean's-yard, Westminster.

Mr. William Arrol, contractor for the Tay and Forth Bridges, was presented on Wednesday with the freedom of Dundee, in recognition of his engineering abilities and skill in completing these great undertakings.

Mr. John Henry Middleton, M.A., Fellow of King's College, and Slade Professor of Fine Art, and of the firm of Middleton, Prothero, and Phillott, of Cheltenham, architects, has been elected to the office of director of the Fitzwilliam Museum, in the place of Dr. Waldstein, resigned. The stipened is £300 per annum.

A communication was received on Monday by Lord Provost Muir, Glasgow, intimating that Lord Lothian, Secretary for Scotland, has appointed Colonel Malcolm, C.B., commanding the Royal Engineers in Scotland, and Mr. W. W. Robertson, surveyor in Scotland of her Majesty's Office of Works, as the commissioners who are to inquire into the cause of the collapse of Messrs. Templeton's mill at Bridgeton on 1st November. The date of the inquiry, which will be held in public, has not yet been fixed.

The town council of West Hartlepool appointed on Tuesday a committee to consider the desirability of providing a town hall with assembly rooms and other accommodation.

MEETINGS FOR THE ENSUING WEEK.

Monday.—Surveyors' Institution. Discussion on "The Tithe Question." 8 p.m.

Tuesday.—Society of Architects.
Institution of Civil Engineers. Paper on "Triple Expansion Engines at Owens College, Manchester," by Prof. Osborne Reynolds, F.R.S. 8 p.m.

Wednesday.—Society of Engineers. Annual Dinner at Holborn Restaurant. 6.15 p.m.
Society of Arts. "The Paris Exhibition," by H. Trueman Wood, secretary to the Society. 8 p.m.

Friday.—Architectural Association. "Drawing," by Reginald T. Blomfield. 7.30 p.m.
Institution of Civil Engineers. "Hydraulic Station and Machinery of the North London Railway, Poplar," by J. Hale. 7.30 p.m.

Architectural Association, 9, Conduit-street, W.—December 13th. Paper on "Drawing," by Reginald T. Blomfield, M.A.

Trade News.

WAGES MOVEMENTS.

Edinburgh.—A general meeting of the Edinburgh operative masons took place on Monday evening, at which a resolution was adopted declaring that the Operative Masons' Association desired to renew the agreement with the Master Builders' Association for the twelve months commencing March 1, 1890, at 7½d. per hour as the rate of wages, and ½d. extra where no sheds were provided. In the event of the masters desiring a conference to consider the advance of ½d. per hour and the ½d. extra in lieu of shed accommodation, six operatives were appointed to represent the Association.

Kettering.—The bricklayers employed at Kettering have struck work for an advance in wages from sixpence to sevenpence per hour. The masters have declined to make any alteration.

A monument to Alphonse de Neuville, the military painter, has recently been erected in the Place Wagram, Paris. The statue is the work of the sculptor, Saint-Vidal, who designed the fountain which figured below the Eiffel Tower. The sculptor has represented the painter of "Le Bourget" and "The Last Cartridges" palette in hand, bare-headed, and supported against a palisade in ruins.

The contract for repairing the Holyhead breakwater, after the damages done to it by the recent gale, has been let to Mr. William Williams, of Holyhead, at £4,000. The gaps will be filled, and the structure will be strengthened with iron girders and bolts. A part of the bull's nose on the sea side of it will be cut off. The Trinity and City of Dublin Company's stores will be filled up, and the parapet widened so that new stores may be built, in order to strengthen it. The limestone for the work will be carried from Moelfre, and the other stone from Holyhead Mountain. The work will now be commenced as soon as possible, as the contract is to be completed in ten months.

Further additions are now approaching completion at the Freshfield R.C. College, near Southport. The work is very plain throughout, so as to keep down the cost. Mr. Edward Blackburn, of Keble-road, Bootle, is the builder, and Mr. F. H. Peate, of Liverpool, is the architect.

Holloway's Pills act so kindly yet so energetically on the functions of digestion and assimilation, that the whole body is revived, the blood is rendered richer and purer, and the nervous and absorbent systems are invigorated. They soon rectify whatever is in fault, restore strength to the body and confidence to the mind.

DOULTING FREESTONE.

THE CHELYNCH STONE.—The Stone from these Quarries is known as the "Weather Beds," and is of a very crystalline nature, and undoubtedly one of the most durable Stones in England.

THE BRAMBLEDITCH STONE is of the same crystalline nature as the Chelynch Stone, but finer in texture and more suitable or fine moulded work.

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Telephone No. 3958.

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120, BUNHILL ROW, LONDON, E.C.
The most extensive Stock of every kind of Wood in Planks and Boards, dry and fit for immediate use.

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender: it adds to the value of the information.

Barnstaple.—For rebuilding premises opposite the Bridge Buildings in the Strand, for the Bridge Trustees:

Youings and Parminter	£2,800 0 0
Hartnoll and Barwick	2,190 0 0
Garland, Hancock, and Co. ...	2,150 0 0
Sanders and Ridge	1,998 0 0
Thorne and Slee	1,995 0 0
Burgess and Karslake (accepted)	1,900 0 0

Bristol.—For erecting new shop, dwelling-house, and premises, Lawrence-hill, Bristol, for Mr. J. W. Lane. Mr. J. Hoddell and Co., Clevedon, architects:—

Colston, W.	£895 10 0
Nicholas, O.	847 10 0
Walters, E.	776 10 0
Forse, H. A.	760 0 0
Tambling Bros....	665 0 0
McLaine, L. A...	582 11 8
Pugsley, W. C. (accepted)	560 0 0

All of Bristol.

Chorley.—For taking down and rebuilding the Rose and Crown Hotel, and an adjoining shop, Chorley. Mr. W. S. Varley, Blackburn and Chorley, architect:—
(Accepted tenders.)
Hotel and shop:—Craven, T., Blackburn.
Stables and outbuildings:—Leyland & Walmsley, Chorley.

Dulwich, S.E.—For the planting of Dulwich Park, for the London County Council:—
Cutbush and Son (accepted) ... £1,014 19 10
[Lowest complete tender.]

Great Yarmouth.—For marble mosaic paving to chancel, St. George's Church, Great Yarmouth:—
Mainzer and Kempthorne, 18, Berners-street, W.
(Accepted.)

Highgate.—For alterations and additions to stables and loose boxes, St. Alban's-road, Highgate, for Mr. W. B. Coutts. Mr. G. S. Stevens, Groove-terrace, Highgate, architect:—

Sparks, W. G.	£798 0 0
Smerdon, R. J.	790 0 0
Dixon, J. W.	745 0 0

Holyhead.—For repairing the breakwater:—
Williams, W., Holyhead (accepted) £4,000 0 0

Lewisham.—For alterations and additions to Nos. 65, 67, 69, High-street, Lewisham, for Mr. G. Stroud. Mr. A. L. Guy, A.R.I.B.A., High-street, Lewisham, architect:—

Salter, Lambeth (accepted)	£585 0 0
Gasfittings:—	
Christie (accepted)	68 0 0

Lewisham.—For the erection of the Lewisham Grammar School for Girls at Rushey Green, Catford. Mr. A. L. Guy, A.R.I.B.A., High-street, Lewisham, architect. Quantities by Mr. A. R. Brede, Theobald's-road, W.C.:—

Higgs and Hill	£10,180 0 0
Staines and Son	9,510 0 0
Kennard, D. and R.	9,290 0 0
Brass, W., and Son	8,452 0 0
Kirk and Randall	8,393 0 0
Jerrard, S. J. (accepted)	8,269 0 0

Lewisham.—For new billiard-room and stabling at the White Hart, High-street, Lewisham, for Messrs. H. and P. Nicholl, Ltd. Mr. A. L. Guy, A.R.I.B.A., High-street, Lewisham, architect:—

Robson	£1,089 0 0
Jerrard	989 0 0
Pritchard	950 0 0
Kennard (accepted)	698 0 0
Bennett	689 0 0

Lewisham.—For new boiler-house and entrance-gates at Anchor Brewery, for Messrs. H. and V. Nicholl, Ltd. Mr. A. L. Guy, A.R.I.B.A., High-street, Lewisham, architect:—
Hoare, R., Lewisham (accepted) ... £157 0 0

London, S.W.—For building retaining walls on the site of the proposed Lavender Hotel, Lavender-hill, Wandsworth, S.W., for Messrs. Ewington and Earle. Mr. H. I. Newton, 49, Victoria-street, Westminster, S.W., architect:—

Rasleigh, S., Clapham Rise	£123 5 0
Hammond, W., Battersea (accepted)	118 7 9

London, W.—For alterations, &c., to the Audley Hotel, Audley-street, W., for Mr. R. H. Barnes. Mr. H. I. Newton, 49, Victoria-street, Westminster, S.W., architect:—

Lamble, S. R., Kentish Town ...	£1,243 0 0
Godden, S., Bryanston-square ...	1,215 0 0
Drew and Cadman, High Holborn	1,167 0 0
Lea, H. and E., Regent-street* ...	1,157 0 0

* Accepted.

London.—For completing houses on Loat's Estate, Brixton, under the superintendence of Mr. W. Eve, 10, Union-court, E.C.:—

Balaam	£2,077 0 0
Cogswell	2,010 0 0
Watts and Long	1,720 0 0
Clark	1,710 0 0
Williamson	1,694 0 0
Hiller	1,680 10 0
Parker	1,675 0 0
Mimmack	1,650 0 0
Black	1,620 0 0
Myring	1,500 0 0
Crook	1,410 0 0
Potterton, Norman Hurst, Cavendish-road, Clapham Park* ...	1,396 0 0
Channing	1,375 0 0

* Accepted.

London.—For additional warehouse accommodation at Deptford, for Messrs. Carter, Paterson, and Co., Ltd., under the superintendence of Mr. W. Eve, 10, Union-court, E.C.:—

Harris and Wardrop	£194 0 0
Godfrey and Son	180 0 0
Johnson, Limehouse (accepted) ...	139 0 0
Holland*...	120 0 0

* Withdrawn through omission.

London.—For completing three houses in Hermitage-road, under the superintendence of Mr. W. Eve, 10, Union-court, E.C.:—
Williamson, Green-lanes £462 0 0

To Municipal Authorities, Engineers, and Surveyors.

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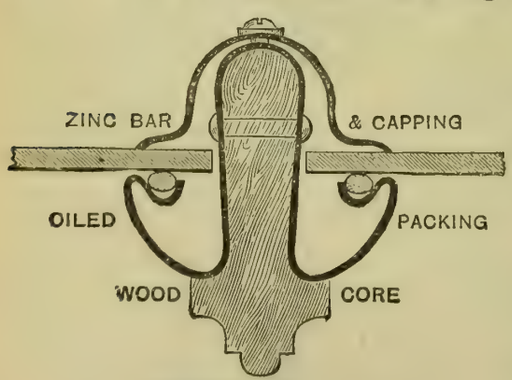
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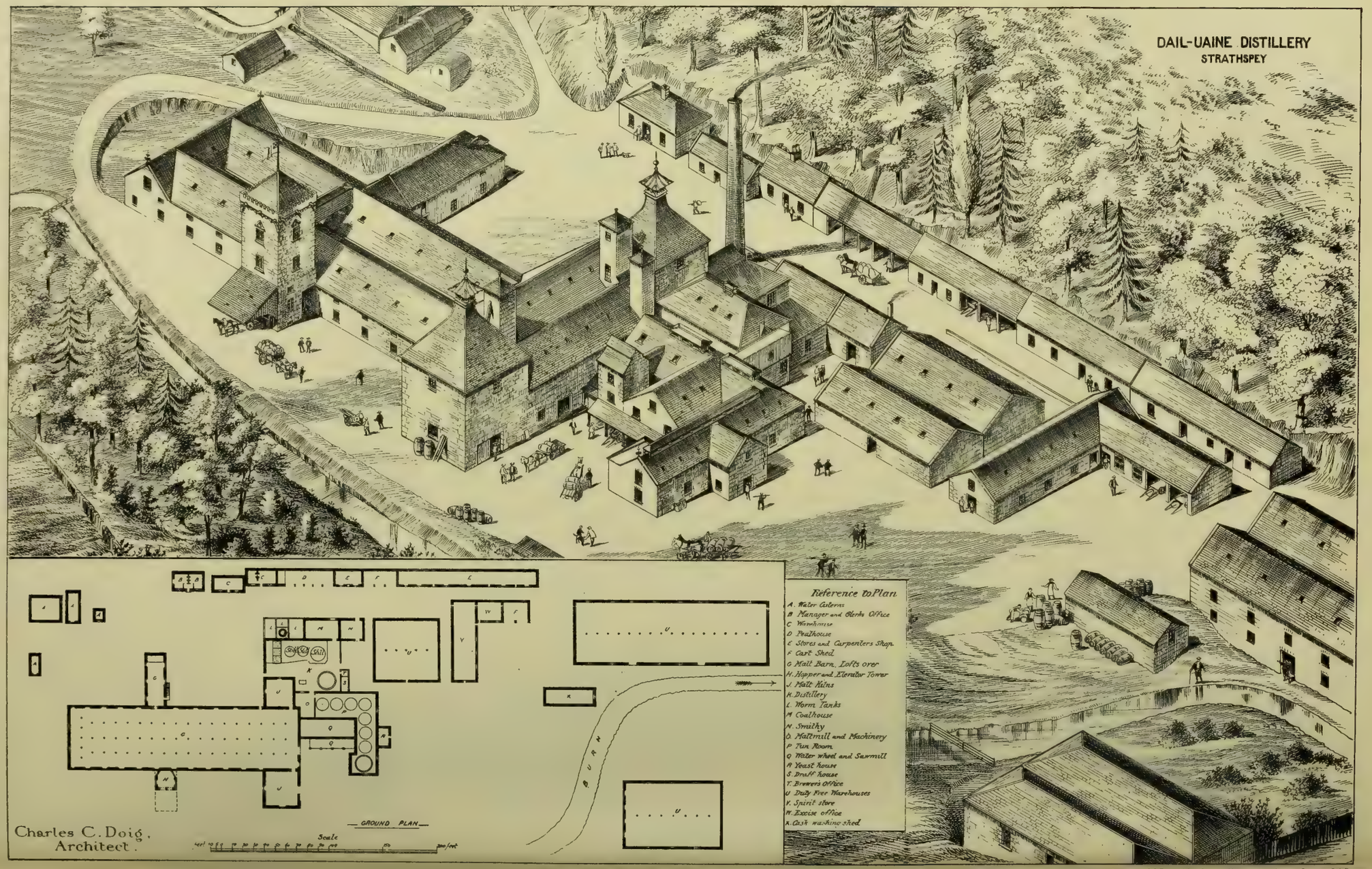
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DAIL-UAINE DISTILLERY
STRATHSPEY
Reference to Plan
A. Water Cisterns
B. Manager and Clerks Office
C. Warehouse
D. Peathouse
E. Stores and Carpenters Shop
F. Cart Shed
G. Malt Barn, Lofts over
H. Hopper and Elevator Tower
J. Malt Kilns
K. Distillery
L. Worm Tanks
M. Coalhouse
N. Smithy
O. Maltmill and Machinery
P. Tun Room
Q. Water wheel and Sawmill
R. Yeast House
S. Draff House
T. Brewers Office
U. Duty Free Warehouses
V. Spirit store
W. Excise office
X. Cask washing shed
BURN
GROUND PLAN
Scale
Charles C. Doig,
Architect.

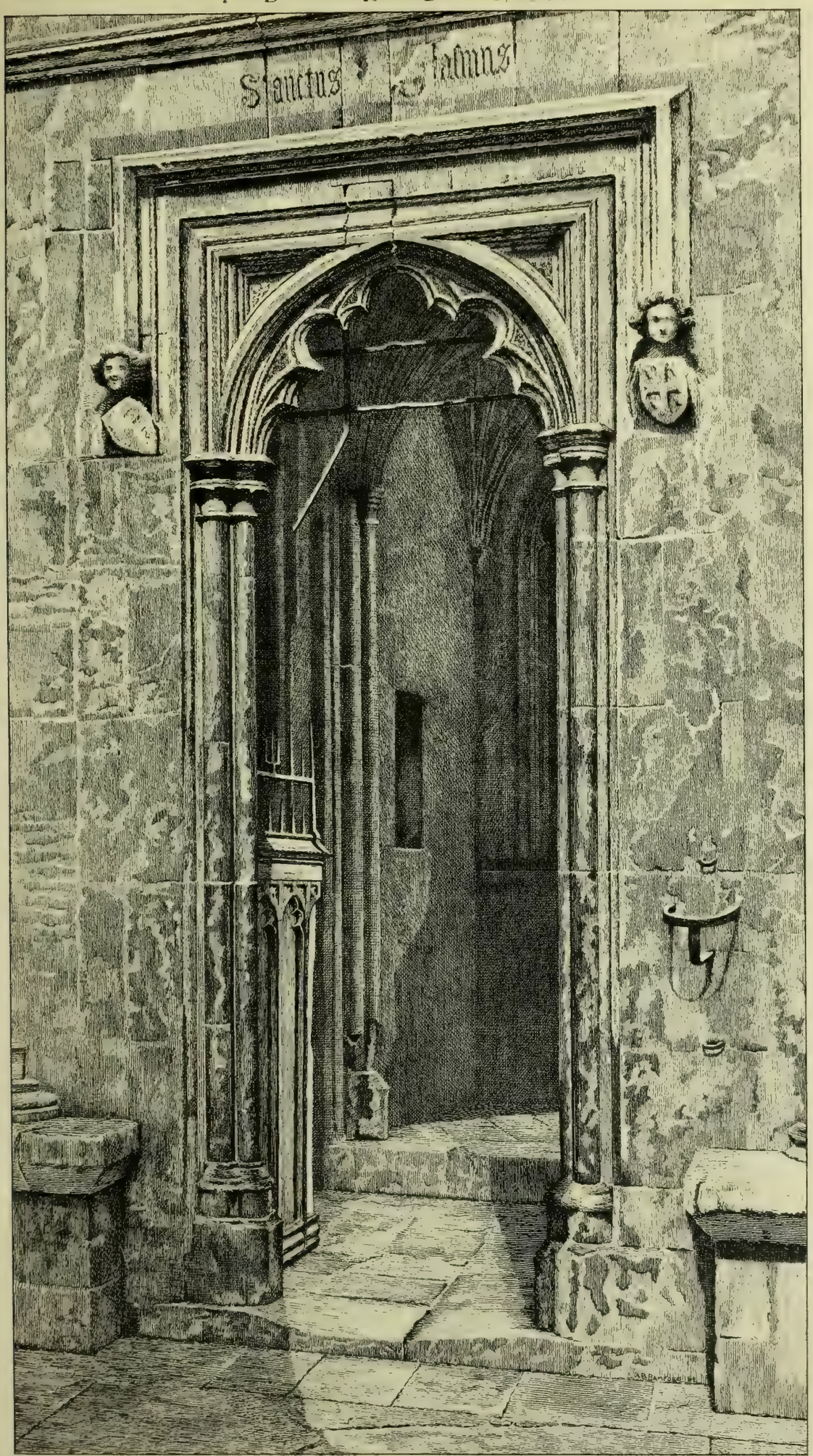
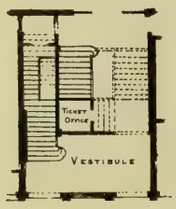


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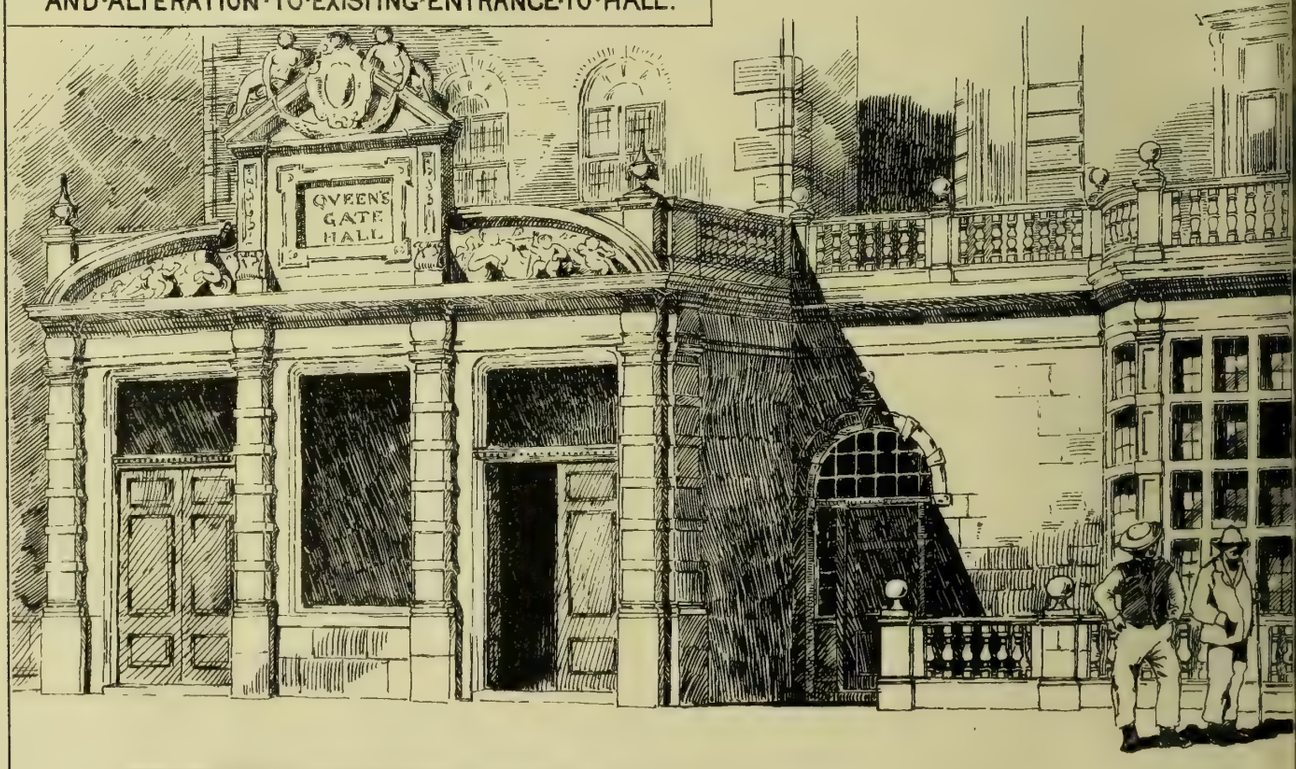
DOORWAY TO ST ERASMUS CHAPEL · WESTMINSTER ABBEY

DRAWN BY A. BENNETT RAMSFORD ARCHT.

NEW·VESTIBULE
STAIRCASES·AND·HALL.

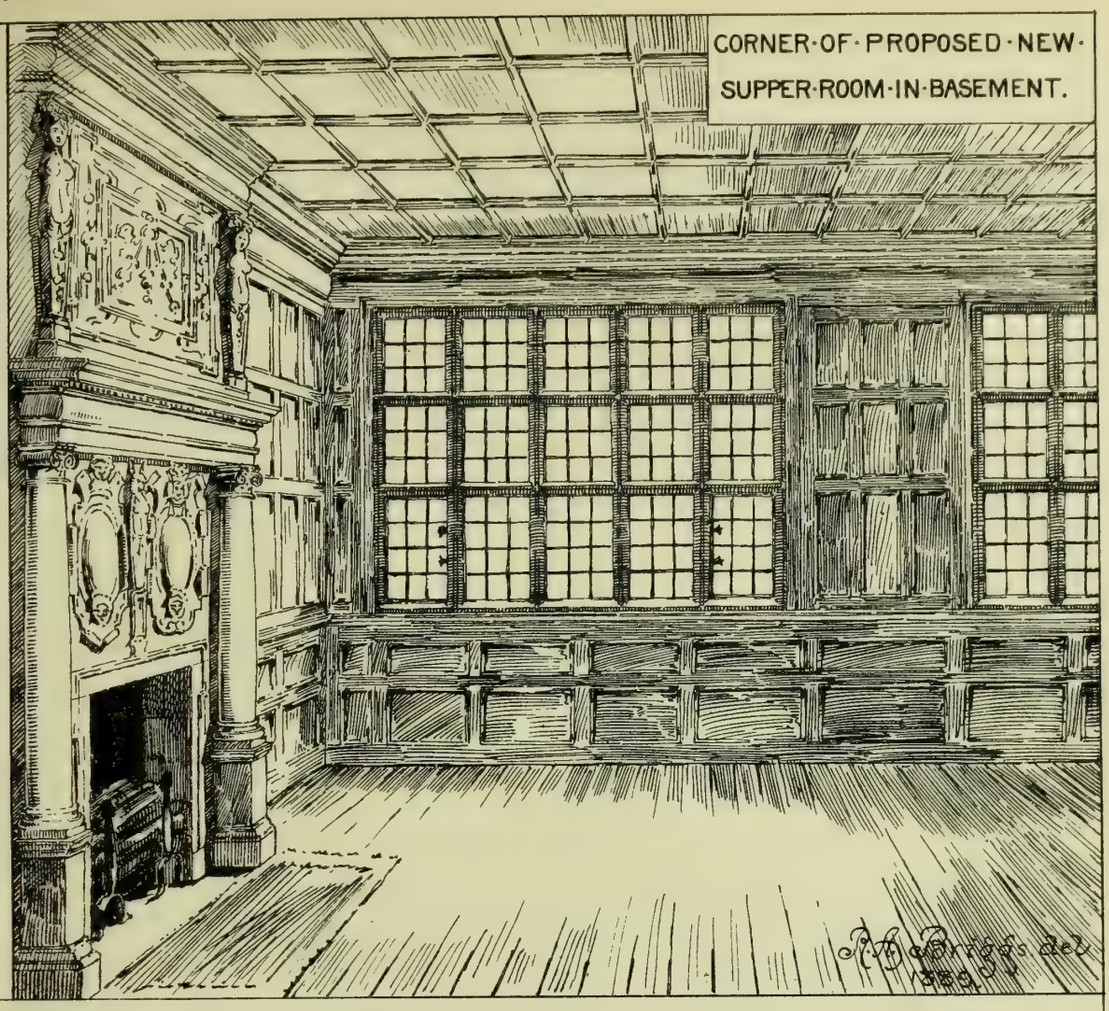


PROPOSED·NEW·ENTRANCE·AND·FACADÉ·TO·BALL·ROOM·
AND·ALTERATION·TO·EXISTING·ENTRANCE·TO·HALL.



R.A. Briggs. del.
1889.

ALTERATIONS·TO·QUEEN'S GATE H



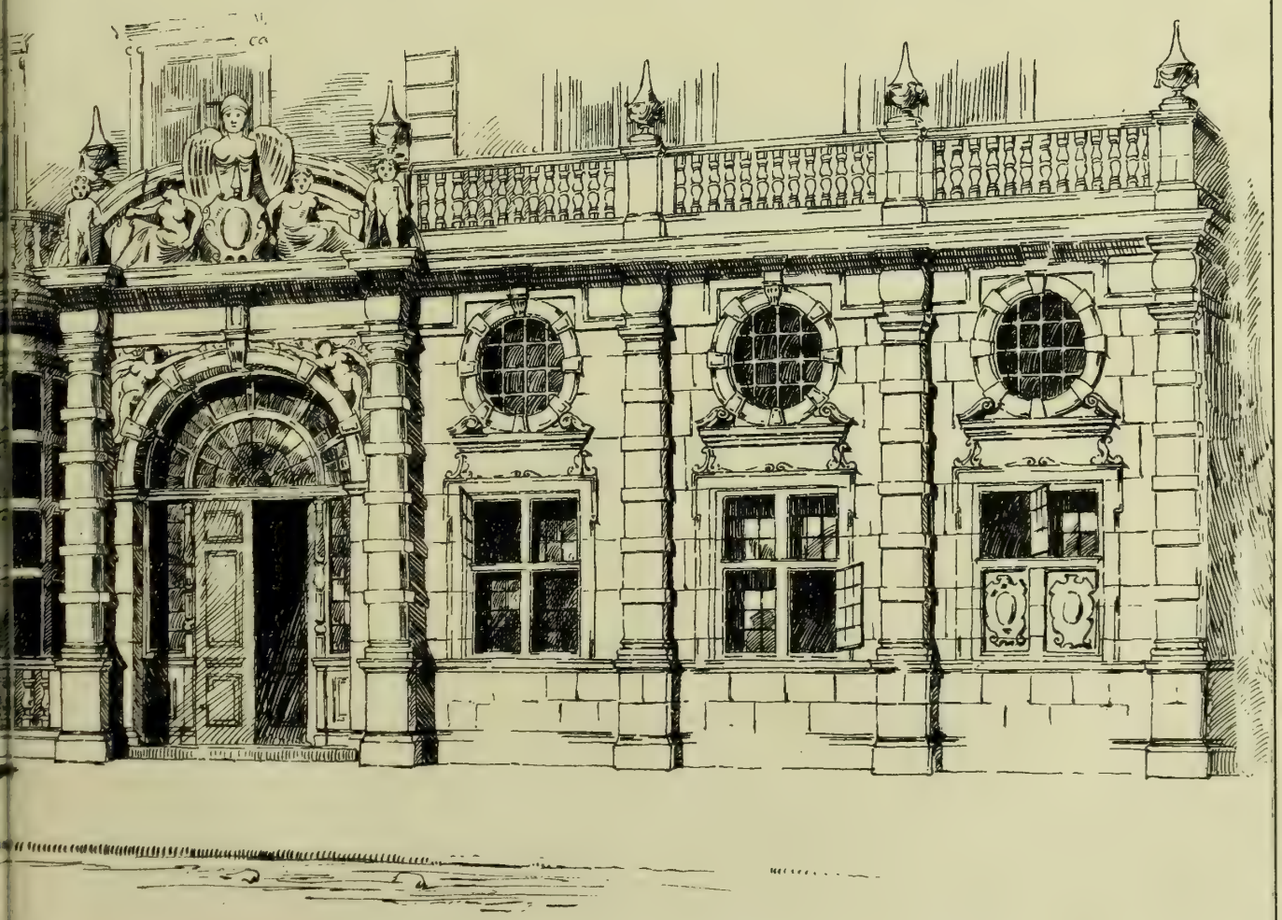
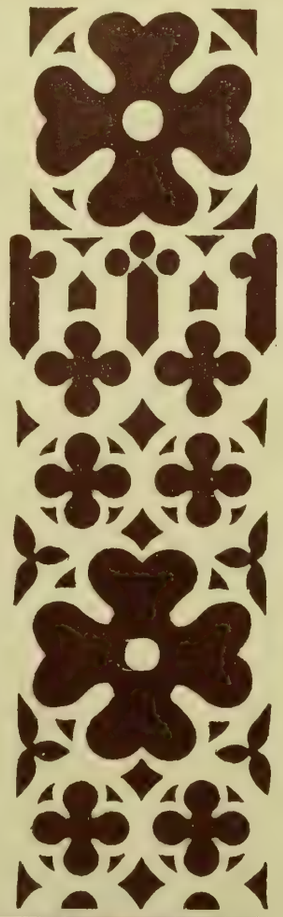


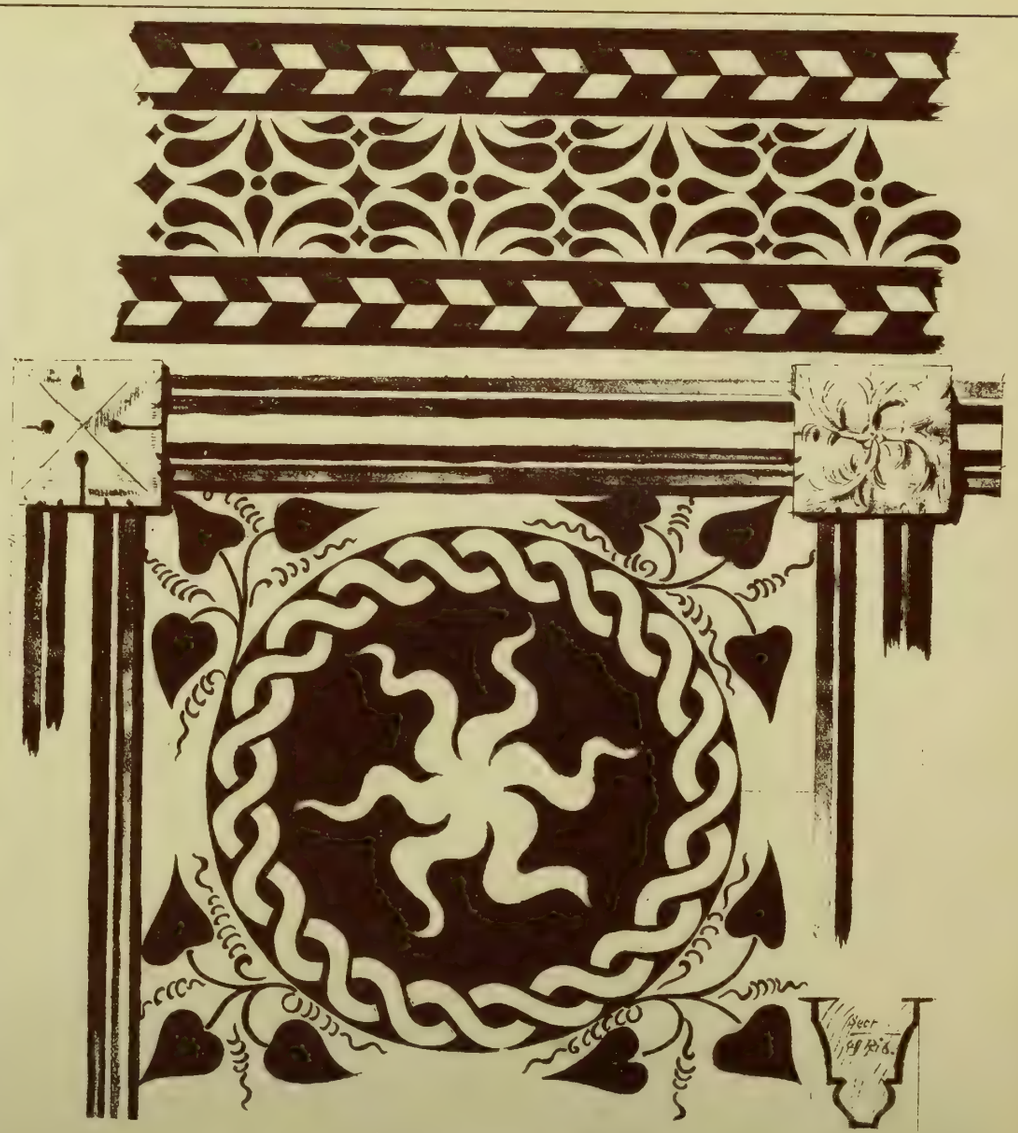
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WELLS CATHEDRAL DIAPER.









MINSTER LOVELL, OXON.









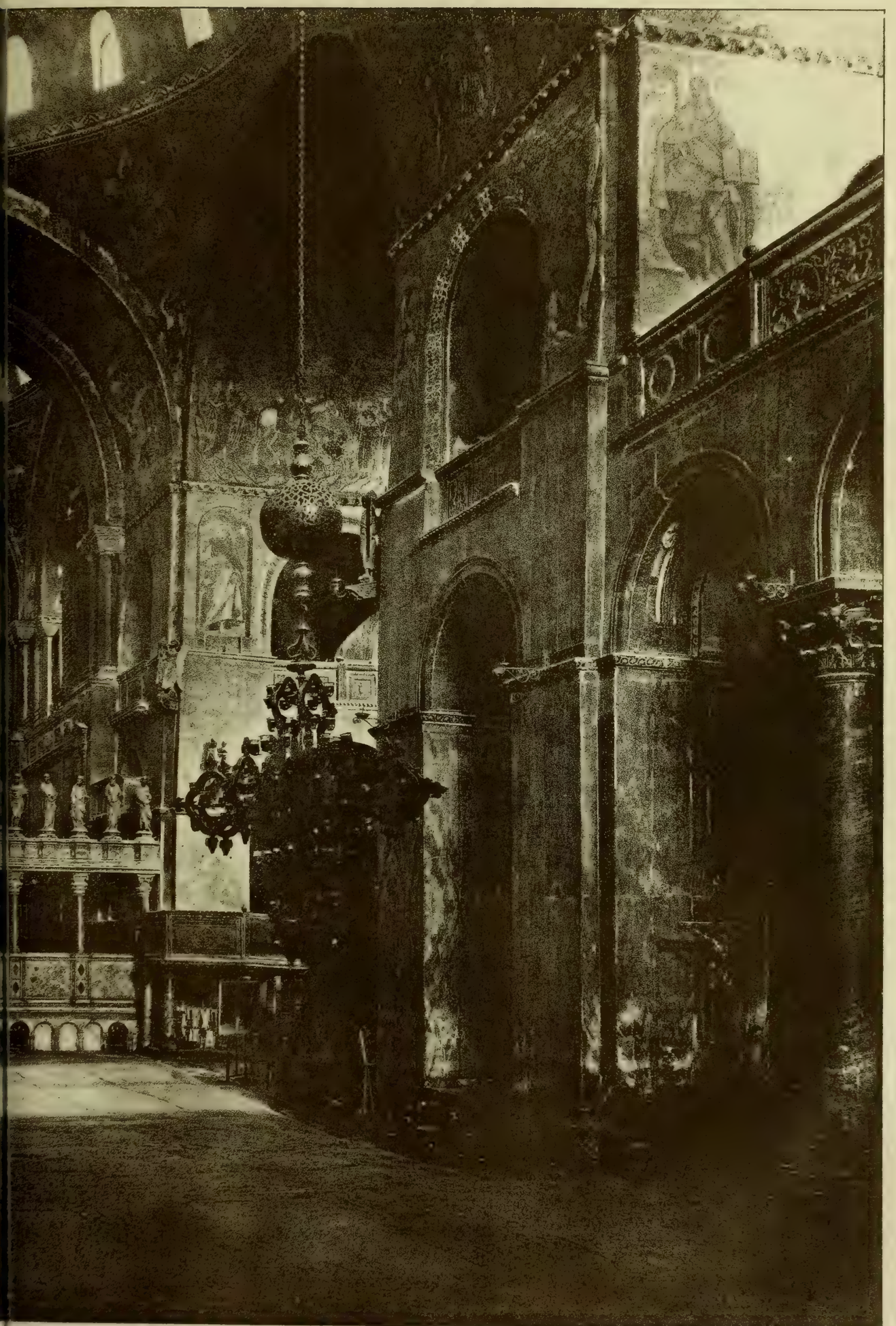
EXAMPLES ILLUSTRATING LECTURE ON THE DECORATION OF CHURCHES

BY E. PRIOLEAN WARREN

Photo-lithographed & Printed by James Akerman, 9 Queen Square W.C.



INTERIOR OF ST



"PHOTO-TINT" by James Akerman 8 Queen Square London WC

ARKS · VENICE

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1823.
FRIDAY, DECEMBER 13, 1889.

PUBLIC CONTRACTS.

THE results of recent experiences in connection with buildings erected by public bodies have proved beyond any doubt that the conditions of contracting for public works are exposed to insidious perils, and a sort of official plunder, from which private contracts are exempt. These dangers appear to be inseparable from the machinery. On the whole, it may be thought that special skilfulness in design and supervision is to be met with amongst those intrusted with public works and buildings. The engineers and architects appointed by public authorities under municipal, sanitary, and educational Acts, are generally men who have attained a good position in special departments, though of no exceptional ability in the higher branches of their profession. They are men who have mastered the practical and scientific sides of their profession, and who have generally good business qualifications, and often tact. During recent years the demand for larger qualifications and requirements in sanitary engineering and building construction has called for more severe tests. Candidates for the offices of borough engineers, superintending architects and surveyors, are now selected from amongst the ablest of their professions, and only those whose qualifications are unquestioned and of a general character are appointed to the best posts. We could name engineers and architects on boards to whom these high qualifications may be imputed. Sometimes in the turmoil of an election to an office of this kind another type of candidate is successful—a result which will continue to be repeated so long as the element of favouritism or partisanship in elections of this kind is permitted to enter. The busy, bumptious, and off-handed official is common enough: he takes care only to give orders or intermeddle in matters of a general kind; but in anything requiring science or skill his deputy acts for him. The duties of an official architect who has a large staff under him are somewhat different to those of the private practitioner; the system itself involves a division of labour that ought to insure very satisfactory results, and but for the imperfection of machinery would doubtless give them. We have lately, in the case of the London School Board Scandals, been made aware of the defects of a system which places authority on a number of divided officials, each being limited in the extent of his control. In our report of the proceedings last week, in reference to the allegations of scamping at several of the school buildings, a clerk of works,—who appears to have done good service, although he has been made the scapegoat for others' laches,—gives several reasons why errors and imperfections have occurred in the work. He alleges that the work was approved by the architect, who expressed his satisfaction when the buildings were completed; that he had charge of four or five schools besides many additions. These facts must be taken into account; they at least throw light on recent disclosures, and show the inadequate kind of supervision given under the system. An architect to a large board like that of a school board cannot possibly bestow the attention to details which a private practitioner can. That labour must be delegated to others. At the most he can only make the general designs and prepare the specifications, leaving for his deputy the preparation of contract drawings and the supervision of the work. A correspondent, who appears to have had some knowledge of the working of the School Board staff, says, in our last issue, that "although almost every one of the schools erected under the direction of the board's salaried architectural staff have been found to be grossly defective; the schools built by architects in the usual professional way have not been found to have any serious fault," a statement which can, we believe, be verified not only in respect of school-board buildings but in other branches of the public service where a large staff of officials are employed.

The duties attaching to an architect holding a public office are mainly confined to attending committees and advising; he is, to all intents and purposes, a consulting architect to the board, and no more. The special architectural skill for which he may be credited has to be left to a staff of sub-architects or draughtsmen; they, on their part, having no direct responsibility, take less interest and care in the design than if they were solely responsible, or had been appointed independent architects. Comparing this procedure with the practice of an ordinary professional man, we must clearly see the difference. The ordinary architect has to undertake the sole responsibility; he devotes his time to the design, contract drawings, and specification, and cannot shirk the superintendence; his assistants work under his immediate eye, and are not vested with a limited power beyond which they are not to go. Again, referring to the London School Board in illustration of the working of outside architects, we can point to a number of buildings erected under their superintendence and from their designs, against which no faults have been found of a technical character. As a correspondent points out, these men, who competed and were successful in the earlier days of the School Board, contributed many valuable ideas in planning schools, which were appropriated by the Board's salaried officers when the Board set up an architect's department of their own. The rate at which the earlier buildings were erected was prejudicial to substantial and good work. In almost every branch of State service in which a number of salaried officials are engaged we cannot fail to notice the weaknesses of "departmental" undertakings.

First, in respect of design: the plan may be based on an approved type; but it may be imperfectly carried out. The principles are reduced to a meagre formula, which is applied to sites and conditions that ought to be treated differently. Then we have ample proof of the hurried manner the schools were built, so many as half a dozen going on at the same time under one clerk of works. Secondly, the departmental system encourages routine, red tape, and subdivision of duty at the entire sacrifice of efficiency. In every department of State service—such as the Army and Navy, the Public Works, Woods and Forests—we have proof of this. There is a strong tendency to shirk labour and responsibility by working in separate grooves—a sort of pigeon-hole arrangement that is apt to get out of order. No better illustration of this can be found than in the evidence on the London School Board. Architect, clerk of works, and contractor have each disclaimed responsibility. The architect had so much to do that he could not give attention to so many buildings all at once; the clerk of works was employed on a dozen different buildings, and declares the architect examined and passed the work; and the contractor, on his part, avails himself of the opportunities thus offered. Notwithstanding the system of routine, it does not appear that certificates of completion were always given, though final certificates must have been. These are special developments of departmental service. Each member of a large staff rather under than over-works himself, and thus much of the work is left undone; the work itself is the result of this intermittent and piecemeal kind of labour—each part is incomplete, the foundations are found imperfectly laid or badly concreted, drains are laid badly, materials are inferior, workmanship is scamped. The adage of each individual of the staff is, "Do so much, and no more." A remarkable thing is that there is no one responsible to see the specification carried out; that the executed work is sometimes quite contrary to the terms therein stated.

Other weaknesses of public departments are found. Public contracts are carried out in a manner that would reflect discredit on a private individual. In the evidence lately published about a large public department it was stated that the only checks on the builder of works and repairs of buildings belonging to the Crown is the occasional visit of the architect or salaried officer. Clerks of works are seldom employed. More astonishing still is the fact that for these works public tendering is not invited; but the building or repairs is given to a builder to make his own estimate, the prices being arranged. There is no formal contract, so that what a business man would never tolerate, if he were going to erect new premises, is allowed in a department which has the management of State properties, and undertakes the erection and repairs of numerous buildings in all parts of the country. Open tendering is the only assurance the public has that a fair and equitable price is paid for buildings, and under a properly-regulated system of control, with a large staff of officials, there ought to be no difficulty experienced. We can understand a railway company employing certain parties to undertake additions or repairs to buildings on their line at a fixed schedule. Skilled labour is not readily obtainable in some of the rural districts, and the employment of a builder in such a case is reasonable; but in London there appears to be no good excuse for adopting the same course in respect of, say, school buildings. If the machinery of supervision is in good working order, open competition seems to be the fairest mode of dealing with the ratepayers' money; but, if otherwise, there may be grounds for selecting a few responsible builders to undertake the work. The results have shown misplaced confidence; that there must have been something radically wrong when one building after another has been found to have been erected in defiance of the specification.

It will be a point of interest to know how tenders are obtained—are they advertised for or privately invited? We may assume there are certain conditions of tendering under which the builders compete; if so, who is responsible for their non-enforcement? What are the conditions? Do they include the general terms of contract? Are the plans and specification and schedule mentioned? Then the contract itself: A contract under seal between a Corporation and a builder, after receipt of tender, generally comprises first the agreement in which the contractor covenants and agrees with the corporation and their successors to perform and execute in a good and workmanlike manner, and to the architect's satisfaction, all the work described or referred to in several documents for a certain sum; also certain schedules annexed, the first of which is the general conditions, the second schedule the specification, and the third the bill of quantities, all of which have to be enumerated and affixed. For many of the works of additions and repairs to the schools, the Board accept, subject to the conditions of tendering, the second or third lowest tenders. Therefore, there is an assumption that the lowest tenderers have either underpriced the work, or that they are irresponsible men. In the recent report of the finance committee we find, for example, the recommendation of the committee to accept the *second* lowest tenders in several cases, and the committee

have in these, it may be presumed, good reason for doing so. The scamping work discovered has been mainly the result of accepting low tenders, without the efficient control necessary to compel the contractor to fulfil his engagements. In nearly every case of tenders invited by corporations and boards, the influence of party feeling is felt, as it is this influence which is so prejudicial to judicious selection and sound workmanship. The public have a right to require that the buildings put up at the cost of the rates should be erected in the most economical manner and at the least possible cost; but their own interests also demand that they should be well constructed of durable materials, so that they may not be subject to continual expense for repairs. The only safeguard is that a careful estimate be prepared in every instance by the board surveyor on a schedule of prices known to be fair and equitable to both parties, and that tenders much below it be rejected. The difference between the highest and lowest tenders is considerable, often amounting to several thousands of pounds. A protecting or guiding estimate, prepared by a surveyor fully aware of the market prices for materials and labour, would render it impossible to select a tender at an unremunerative amount. After the estimate was made tenders could be advertised for; those a certain percentage below the estimate being set aside. On the other hand, there would be the assurance that no exorbitant sum was being paid, and that no favoured contractor was being dealt with at his own uncompetitive prices.

WARMING AND VENTILATING BUILDINGS.

DURING the approaching inclement season attention will be again directed to systems of warming and ventilation. Old and threadworn as the theme is, it has a perennial interest, and is forced upon the attention by the numerous failures of our churches, public buildings, and houses to maintain a comfortable temperature. The architect will not apply himself to the problem, because he considers it scarcely a part of his duty, so long as he supplies the necessary space for a heating apparatus; the engineer or expert fails to effect the object because he has had no part in the design and construction of the building, or is limited to a certain expenditure. The consequence of this divided responsibility is that the frequenter of our churches, theatres, and assembly-rooms has to put up with a state of things that is certainly not flattering to our science and inventive powers. On all hands the questions that generally meet us are, What are we to do to ventilate?—the building becomes uncomfortably hot during service, or during the performance of a play. What can we do to avoid draughts? Which is the best or most economical heating apparatus for our school or place of worship? Unfortunately, it happens that these questions come after the building has been erected, and therefore the suggested plans must be of a remedial kind, which are always the most expensive and generally the most inefficient. Often we are told that some system already adopted does not answer, and a substitution of another apparatus is required. It is not an easy matter to answer questions of this sort, for the plain reason that we are ignorant of the real facts—how the building is arranged, its situation, what are its materials and how built, and whether the system is properly carried out.

Architects are sometimes asked these questions, and though it is not strictly an architect's duty, he is at least supposed to be able to suggest a remedy or to propose a scheme. He comes to the task rather handicapped. Is it likely that he will suggest anything that will spoil the structure he has designed? Is it likely that he will allow the ridge to be surmounted by a louvre turret or a ventilator "outlet," the tesselated paving to be spoiled by large open iron grids, the window tracery to be mutilated by any form of ventilating inlets, and pipes and flues introduced into corners and gables? He cannot advise things so antagonistic to architecture and so destructive of internal effect. Under his direction the least radical measures are adopted; perhaps he recommends a hot-air chamber to be built below, and flues brought up to various openings that will not be seriously objectionable. He may advise a stove, or a ventilator on the roof with more or less success. These may remedy the objectionable stuffiness of an over-heated atmosphere; but there is still the complaint of down draughts and a want of an equable temperature. If an engineering firm is called in the remedy may be more thorough; but we know it is often at the expense of the architectural appearance. We have seen churches spoilt by stacks of pipes along the walls and passages, coil-cases made to project from the walls, fierce heat being given out in certain points of the interior, but the other portions left miserably cold, especially the roof, from which streams of cold air are continually descending.

The maintaining of an even temperature during cold and frosty weather is the admitted difficulty, which the usual systems of warming do not give us. An open fire or a stove heats only a circumscribed space, and rather intensifies the cold felt beyond its influence by the currents of cold air which flow in from all round and through walls, as well as windows and doors, towards the source of heat. Till we find some means of warming the incoming air from these sources, the skill of the heating engineer will be confined to the improvement and invention of stoves and apparatus. The nearest approach to a perfect system of heating a building, whether a house or a church, is to surround it with warm air, so that both through walls and openings an even flow of tempered air may be maintained. Those seated round the outer walls, and therefore, the larger number of occupants, would receive the fresh warm air first, thus they would be quite free of disagreeable currents of cold air; and those next them, occupying the centre area of building would equally enjoy the temperature. Such a system is the reverse of the principles now adopted, which is to have the heating within the building, and the outer walls cold, so that the whole building is surrounded by an atmosphere considerably colder than itself. Imagine what our houses would be if we could maintain a reservoir of warmed air in our halls and passages and outside our doors, so that when we opened a door of a sitting-room, instead of shuddering with cold by the draughts of cold air which rush in, we should find the outer hall air of equal temperature with that of the room. We may partly effect the object by warming the air of the hall by a stove, or by coils of pipes, or by hot air from a furnace chamber beneath; but still we should have cold air rushing through the opening of the outer door and crevices, so that the air would be only partially warmed. If we could warm the inrushing air at the very threshold, we should be meeting the difficulty. Attempts have been made to warm the air as it enters. Some of the heating arrangements are based on the principle of drawing in the cold air externally at points, into a heating-chamber, before allowing it to enter the building. In this manner the great inrush of cold air to supply the requirements of combustion and ventilation in the building is prevented, the cold draughts from windows and doors are diminished in amount, and more comfort is insured. Architects are to blame if they do not see the requirements of a scientific system and apply the remedy. Several public buildings are heated on the principle we have stated. The Free Trade Hall, Manchester, is an example of economical heating, the fresh air being supplied from the outside by openings which communicate with a brick flue which surrounds the basement. From this flue vertical flues deliver the fresh air. "Convoluted stoves," by Constantine and Son, warm the air during the winter, and the same plan has been used in several other buildings, such as the Manchester Royal Exchange, the large Assembly Hall in the Mile End-road, and in numerous places of public worship. The air is admitted through fresh-air gratings round the outer walls, and then drawn into an air-chamber or basement, which can be warmed by a heating apparatus or stove.

The Grundy apparatus is based on the same principle of warming the air before it enters through appropriate gratings in the floor, while the cold air that would have been a source of discomfort is drawn out. Its successful application for houses as well as public buildings is attested by the fact of its being so largely employed. We might mention other systems of more or less efficiency. Many heating apparatuses fail through the over-heating or burning the air owing to the small quantity of air brought into contact with the apparatus; others through the arrangement of the air-flues, which heat only one portion, and leave other parts cold. The equal diffusion of the warm air is the first essential, and this can only be insured by considering the natural draughts and currents in the building, the sides exposed to the prevailing winds. Many of our churches with large open timber roofs are subject to down-currents of air, chiefly owing to a want of ventilation by roof outlets or extractors, as the air that has been vitiated ascends by the warmth of gas to the surface, becomes cool, and descends again to be re-breathed. The air next the slates is always colder than the lower strata, and unless abstracted by proper means, sinks down to be diffused with the other air.

How much can be done by preventive measures, and these are within the architect's control. Cold and damp walls can be avoided by precautions to which it is not necessary to refer here; proper basements for heating and flues for distribution can be devised with less cost at the commencement than after the completion of a building; roofs can be boarded and felted, and supplied with proper ridge ventilators. Somehow or other, these requirements are thought to be outside the architect's proper work, and they are placed in the category of "extras" or special requirements, and left for those who come after to do.

SOCIETY OF ARCHITECTS.

THE third ordinary meeting for the present session was held on Tuesday evening, when there was a large attendance, including several ladies. Mr. W. H. Seth-Smith, ex-president, occupied the chair. Three nominations for membership were read.

The following paper, which was illustrated by many proof engravings and etchings, and by diagrams, was read by Mr. A. Wallace Rimmington, R.P.E. (Associate), entitled

ARCHITECTURE SEEN THROUGH THE PAINTER'S GLASSES.

To use the words of an old President of the Academy, "I do pretend to no skill in the divers technics of architecture, I do judge now of the art merely as a painter. I would therefore ask you to consider anything I have to say as merely suggestive of some trains of thought, which if you think it worth while I shall leave it to your more able and experienced architectural minds to follow out." The analogies which may be traced between architecture and painting are closer than is generally supposed, and it has often seemed to me that the subject is one which, if consistently followed up, might lead to some interesting in-

erences and perhaps to some useful results. A fabric if it has any claims whatever to be an architectural building, is, of course, a work of art—perhaps a bad work or perhaps a good one—but, in any case, the work of an artist. The architect is first and above all thing an artist, though the contrary is nowadays often implied. Otherwise, however good, deep, and scientific a knowledge he may have of methods of construction, of the calculation of strains, the arrangement of ventilation and drainage, and a hundred other important matters of this kind, he does not really differ much from a builder or an engineer. If this is granted, then, as it stamps him as an architect, one of the most important sides of his work is the artistic side, and considering how closely other sections of the arts are allied, would it not be reasonable to suppose, even before looking more closely into the matter, that painting and architecture are nearly related to each other, and, if not absolutely first cousins, are at any rate first cousins once removed? And to go one step further, that if there is any body of laws more or less accepted as underlying the art of painting, it may possibly be worth while to see whether some of them are not also applicable to architecture. It is proposed to examine a few—only a very few—of these laws, and it is hoped that your concurrence will be obtained in thinking that there are, at least, some grounds for the supposition mentioned. The subject has been neglected to a great extent, but there is a reference to it so long ago as the last century in one of Sir Joshua Reynolds's well-known discourses. He said: "Architecture certainly possesses many principles in common with poetry and painting, especially that of affecting the imagination by means of association of ideas." In speaking elsewhere of Vanbrugh, he says: "He had originality of invention; he understood light and shade, and had great skill in composition to support his principal object; he produced his second and third groups or masses." This clearly shows that the subject had crossed Sir Joshua's mind, but with the exception of some passing references by Mr. Ruskin, few, if any, recent authors or artists have dealt with the subject. Let us now endeavour to discover when and where and how these laws of composition came to be recognised by the painter, and how they underlie his art. The popular idea of a picture is that it is a more or less close imitation of a piece of nature. The popular mind usually imagines that the more slavishly the copy of the piece of nature is made the better will be the art, and the better the picture. There is, no doubt, a certain truth beneath this idea, but it is very far from being the whole truth. As a matter of fact, you cannot imitate nature exactly, or even the smallest and simplest piece of her. Pigments will not give you a thousandth part of the force of nature's lights, or a twentieth of nature's darks. Hold up a piece of white paper in full daylight against a bank of sunlit clouds, and it will look almost black. That is to say, you cannot paint the clouds, but only suggest them. Draw a building at a little distance from you, and try to give the full force of the darks in its windows, and you will destroy all idea of its size and grandeur. Endeavour to paint a piece of distance with the colours and light and shade it really, or apparently, possesses, and you will fail ignominiously. Nature, in a word, cannot be exactly imitated; but she can be suggested, and the suggestion, if skilfully arranged on the painter's canvas, will recall the scene with far more relative truth and force than a photograph or anything else. But to do this, to express or to suggest the breadths and grandeur of nature, its delicate tones, its colour, and subtle forms of light and shade, the painter must employ every artifice within his knowledge; he must make certain adjustments, certain arrangements, and even certain changes, in order to be able to express himself efficiently. Those pictures which are apparently most realistic are almost always those in which the painter has most employed the artifices of his craft. As has been well agreed, art is art because it is not nature: words which have far more in them than appears at first sight. It is essential to touch upon this, because otherwise you might think that in speaking of composition and the laws of composition the deliberate falsification of nature was being advocated. We cannot be absolutely true to nature because pigments and light and impossibility of giving scale will not allow us to be so, and the question is what minor truths shall we sacrifice in order to be most faithful in the great ones; whall points shall we emphasise, and what disturbing influences shall we destroy? The laws of composition in painting are those natural principles which will guide us in doing this and in selecting our subject. They are also the artifices which enable the painter to cope with nature on slightly better terms, and which help him to make his picture interpretive, expressive of emotion, of sentiment, and idea, to make it beautiful and harmonious, and not a mere collection of incongruous forms crammed in between the four lines of a frame: in other words, to make it a work of art. It is often objected by writers who have not gone very deeply into art subjects that rules and laws, or, as they are pleased to term them, academic rules, tend to fetter genius and to remove art further from nature. It is, therefore, perhaps worth while to point out that these laws are really all derived from the observation of nature. A good artist, when he see a beautiful group of trees, a fine building under telling arrangement of light and shade, or an exquisite harmony of colour, asks himself upon what causes this beautiful effect rests, splits it up into a series of combinations, analyses it, and stores up the method of its being in his mind. In time he gets to find out that there are certain rules or laws upon which nature works in producing her most beautiful and powerful effects, and gradually he learns that when his picture is bad and out of harmony it is because he has broken some one, or more, of these laws. In time, too, he learns to use some of them in putting his work together, or in choosing a subject which is an illustration of some great law of beauty or power. These laws, then, are not merely an artificial creation of schools or academies, cliques, or individual artists, they are direct deductions from nature herself, and it is a remarkable fact that in the only two arts which can really be said to have made much progress during the last century, those of music and landscape painting, these laws have been more studied and considered than in any other. They are but helps, they cannot create a genius, or give a man the power of appreciating or designing a single beautiful form, if he has not it in him, but they can greatly lighten its labours and smooth its path, and help it to express itself. Many of these laws are difficultly stated in words, and some great painters use them almost unconsciously, but this does not disprove their existence or their usefulness. Such a man as Turner, who had no faculty for putting his thoughts into words, could show another artist instantly what to do to complete the composition of a picture, and it has been easy to deduce a series of defined laws of composition from his works. Let us now examine a few of the simplest of these laws. One of the first and most important laws of painting is what may be called the law of predominance; that is to say, that there shall be a central idea in a picture, that some one feature, mass, shadow, form, or colour shall predominate. It is the most universally accepted of all laws in art, this law of deciding that in a given work some one thing shall hold the attention or appeal to the emotion. In any good picture this is invariably the case, though in some it is not so obvious, because of the clever artifices which are resorted to to hide the fact. Objects which might conflict are often present, but are actually made to assist the predominance of the principal feature by leading the eye to it, supporting it, or throwing it out by contrast of colour or material. This first very simple and obvious law has been taken because it is so evidently applicable to architecture, and is one with which every architect is more or less conversant. Almost all good buildings have some great, principal feature to which the others are deliberately and intentionally made subordinate, with the result of adding unity and dignity to the whole. But perhaps it might be worth while for architects to go a step further and examine some of the artifices of time and form, of accentuation of parts and arrangement of light and shade, by which conflicting features are, by a good painter, brought into due subjection to the principal one, and even made to assist its impressiveness. If you go to the National Gallery, and examine almost any picture there amongst those of the later schools, you will find that part of the effect of the picture depends on this law of predominance. To turn to architectural buildings, in which it has consciously or unconsciously been observed, it is only necessary to refer to such as Lincoln Cathedral, where the design is so skilfully managed that the subserviency of all else to the great central tower is carried out in such a way that the tower, without being isolated, or too obviously the one great feature, both helps and is helped by the building. So, too, it is in the great west façade of Strasburg, where its immense rose window seems to bind the elaborate design into unity rather than to overpower it, where the eye instantly feels its predominance, but where it rather ennobles the façade instead of dwarfing it. How often, in our own cathedral fronts, is the lack felt of a sufficiently predominating feature? And in other buildings, how often, when a principal feature is provided, might not the architect have borrowed a hint from the painter in preventing its predominance being obtrusive and inharmonious? How this can be done is best discovered from an examination of the works of some of the old masters; but this law of predominance is so obvious to the architect that we may pass on at once to the laws of continuity and radiation. There are no more potent principles in painting than these. It may almost be said that, observed consciously or unconsciously by the artist, it is almost impossible to put together a picture without them—a picture, that is, that is anything more than a mere study. They are the very backbone of landscape painting, and you will find them most fully expressed in the works of the best figure painters. Continuity may be described as the knitting together of a work of art by making its essential forms and lines continue or reproduce themselves, while radiation is the method by which in nature and art they are made to do so harmoniously. Radiation, as a principle, lies very deep and runs into many other things besides architecture and painting. It has its parallel in the truth that things and actions are most powerful when they spring from some one motive, and express some one great guiding idea. In order to explain more clearly the principle, two diagrams must be shown to you. The first represents a series of curved lines flung promiscuously on the paper, much as a bad painter often flings them in his picture. The second shows the same set of lines subjected to the law of radiation and brought into harmony. They are still free lines, they have much liberty left them, but they refer to some common purpose, they suggest a point of radiation, and some controlling will or idea. Continuity is virtually another form of the same idea, though more difficultly illustrated. It really means the interdependence of parts upon each other, the deliberate coupling of them together and continuing them on. The principle can be illustrated by means of an etching of a picture by B. W. Leader, perhaps the most popular English landscape painter of our day. The lines of the foreground are arranged on a principle of radiation—or, in other words, the point of view is so chosen as to force the perspective so to arrange them. The branches of the trees, strongly accentuated against the sky, are, broadly speaking, so beautiful because they follow out the natural laws of radiation. So, too, in Turner's "Liber Studiorum" series. Examine the drapery of any good Greek statues, or the bas-reliefs of a great artist like Jean Guyon, for instance, or that of the figures in pictures by Titian, Alma-Tadema, Albert Moore, or other well-known painters, and you will find that its lines are almost invariably arranged upon radiating principles. So, too, the drapery folds of the figures in good examples of Mediæval, Renaissance, and modern painted glass. The principle is not always very obvious, it is often disguised by artifice or broken into to avoid monotony, but it is of almost universal application. The systems of curvature, to which the principle is applicable, are almost endless, and, amongst natural objects, may easily be studied from trees and leaves. Even the decorative artist should study such systems, that, when he sees them in nature, he may be able to appreciate and draw them, and that when, perhaps, he has some ugly ends of lines of tangled forms to deal with in his designs he may better know what to do with them. Turning from painting to architecture, we can easily see that the principle is applicable to architectural design, especially to its detail. In a Corinthian capital, not only the central ribs of the "acanthus" leaves, but also the deeply indentated edges of the leaves, form parts of radiative systems. Prolong the ribs downwards and they will tend to meet at an invisible point of radiation. Take, again, the exquisite Early English form of foliated capital and sister capitals on the Continent, and the same thing applies;

he vertical stems and lobes of the foliage almost always belong to a very beautiful radiative system. Examples of the principle are so numerous that it is difficult to choose from them; but amongst others may be instanced the lovely radiations of Flamboyant window and wall tracery. The windows of almost every Norman village church will show a new system, only disguised by the design being partly geometrical. The principle is very fully developed in many of the plaques on the walls of St. Mark's at Venice, and there are beautiful instances of it, as far as details are concerned, in the porches of Rheims and Amiens, in architectural linen patterns upon stone and woodwork, in Early Renaissance plaques, and in wrought-iron work of all periods. I think you will find upon experiment that, if you pick out any decorative design as being peculiarly beautiful, upon examination it has a radiative principle somewhere and somehow interwoven into it. Who has not been struck by the beauty of some of the old ironwork "finials"—the radiative principle is invariably very strongly marked in them. A peacock's feather is very complicatedly radiated. How easily it can be used decoratively, as also a shell, and the architectural forms derived from it. Let us now go one step further and examine the principle in connection with continuity. Invisible lines of radiation are, in the belief of many great artists and that of our greatest art critic, Mr. Ruskin, very potent in bringing a number of dissimilar or irregular objects into harmony. Apply the test to any buildings, or part of buildings, that you think particularly harmonious in sky line, and you will probably admit that, broadly speaking, they conform to the law. Continuity may also be secured by taking care that the projections of the sky line not only occur in a pleasing succession, but also fall within a curved line of good character. The effects of perspective greatly help the architect, by bringing both the laws of continuity and radiation into play without any effort on his part. Much of the impressiveness of many buildings is doubtless due to this. The interiors of cathedrals need only to be instanced, where the decorative forms of the triforium often break up, while they assist, the lines of radiation without destroying them, in conformity with another principle of composition, upon which there is now no need to touch. The great use of most of these laws is to help to obtain repose—that grand quality which is the true source of power in so many great pictures and architectural buildings. In a picture repose is not always required; but the buildings in which it would not be aimed at by the architect would be very few and far between. Its absence is often sought to express movement in a picture; but this is seldom needed in a building. It will be better, therefore, for the architect to study most those laws of composition which help the painter to give repose to his work—repose, however, without monotony. A means of obtaining repose which has been adopted by many of the greatest painters, though of late it has somewhat been neglected, is that of repetition. The principle explains itself. It is that of repeating some characteristic form several times in a picture; the form considered as a patch of light and shade or colour, not, of course, a mere repetition of an object. The essence of the principle lies in slightly varying the form and in reducing its size. You will find this adopted in almost all the pictures and sketches of Turner, Prout, Cox, De Wint, and others. You will find it carried out over and over again with great subtlety, for example, in Turner's great picture of the "Crossing of the Brook," in the National Gallery, where the forms of the clouds repeat those of the strangely-contorted crests of the pines, and where the lights upon the buildings in the middle distance are repeated by the blocks of stone and their reflections in the foreground, besides innumerable other repeats. Once see the principle carried out in a few great pictures, and you will appreciate its value. The question now is, Can it be made use of in architectural design? In examining a considerable number of old buildings of the best periods, one comes to the conclusion that it not only can be, but has been, used to a considerable extent. Whether consciously or unconsciously is a matter beside the question, because, if advantageous, it can but be useful to define it clearly for future use, even though it may not before have been looked upon as a guiding principle. Its strange power in producing repose is probably due to its being suggestive of orderly succession of events or objects. Orderly, yet with the interest of free will about them, though obeying some law for the general benefit. Repetition is what probably gives its extraordinary charm to the slightly broken reflections of objects in a lake or a river first stirred by the breeze. Nothing is more suggestive of repose than the subdued reflections of a group of trees in still water. Trees by themselves are not suggestive of repose, nor are these the absolutely accurate reflections of a looking-glass; but it is the slight alterations of colour and form that give the true reflections their charm, as in Japanese design it is the slight deviations from symmetry that make it so eminently decorative. Applying this to architecture, it is not the mere repeating of detail—which, of course, exists in all buildings, good or bad; but this nobler kind of repetition is submitted to your consideration—the repetition of some striking, or beautiful, quaint, or characteristic form in a modified shape; the echoing it, in fact, and gaining the charm of the natural echo. In many of our English cathedrals you will find excellent examples of this. In Ely Cathedral the characteristic form of the central tower is repeated again and again, one repeat being in the finials of the buttresses, which a less skilful architect would have made more of the ordinary outline. In the castles of Southern Europe there are often very beautiful repeats of this kind; some characteristic form of tower, turret, or gateway being repeated with a variation, just where a good painter would repeat it. So also in much of the domestic and street architecture of Southern Germany and Central France. Another principle about which there is entire unanimity amongst painters is that of contrast. It would be well to take contrast of light and shade and line in the first place. Another kind of contrast may be referred to afterwards. Contrast is at the very root of the painter's art. Without contrast he cannot express even a sense of light. Both darkness and light in painting are made visible by contrast. An entirely new character can be given to a thing by the use of it. Take a sheet of paper covered with a middle tone—*i.e.*, half way between black and white—place a spot of black upon it and it will look light, place a spot of light on it and it will look dark. Bring the black and the white together and each will add enormously to the force of the other. So too with line. Take a circle and there is nothing particularly pleasant about it, but inclose it by a square or an octagon and both become at once much more pleasing from force of contrast. Contrast is so powerful an instrument in composition, however, that the best painters are very careful not to overdo its use. A picture is helped by one or two or more passages of powerful contrast: sharp darks entering boldly into lights, or warm colours telling forcibly against cool ones; but in the greater part of the picture the artifice is not resorted to. Harmony is the great artistic object, and some few forcible contrasts will help to drive a picture into harmony. So, too, in sculpture: a good sculptor is not lavish of his strong shadows. He employs only a few to give solidity and delicacy to his softly moulded surfaces, to make them better felt. In composition of line the painter will oppose the angular forms of a building by globular shapes of cloud, or the too softly flowing draperies of his figures by the utmost angularity in the treatment of the accessories in contact with them. Hence the preference of many figure painters for Classical backgrounds to their figure subjects. Contrast of line is at the root of the preference. Turning from painting to decorative art and architecture, one use of contrast in painting undoubtedly disappears—that of assisting to drive the distance back. This is not necessary in architecture; but if the power and use of contrast were more generally understood, we should see fewer buildings so full of monotony and tameness of design. That the Mediæval designers fully appreciated it is beyond question, at any rate those of Northern and Central Europe. The sculpture which filled the niches of their buildings, the arrangement of projecting parts, and the groupings of their masses, were frequently treated with reference to the principle. In Moorish buildings, also, the carefully-adjusted effects of contrast are very beautiful. The Early Renaissance builders well understood it also; many of Wren's churches owe much of their impressiveness to it. One of the great uses of contrast is to assist in giving scale. To give a trite example, the small doors which the Mediæval men sometimes set beneath the vast porch of a cathedral is often severely criticised. But in many cases they unquestionably give great scale; and the effect of very small windows contrasted with large ones often helps the dignity of a building. In entrances to old conventual buildings in England you often find a small gateway placed unconventionally beside a large one, with most happy result, and we all know how greatly a turret assists a tower. But though, as in painting, contrasts of light and shade and proportion are valuable to the architect, and he may render a large uninteresting surface beautiful and characteristic by their use, it is, perhaps, still more in connection with forms and lines that he may find the principle of service. In decorative designs the advantage of the opposition of an occasional straight line to curves—pointed and angular forms to rounded ones—and quick to slow curves is generally recognised. The beauty of cusping in an arch is greatly due to contrast, and the agreeableness of an arch beneath the straight sides of a gable is another instance. The value of contrast of line can, perhaps, be best appreciated by an example of its neglect. This rough sketch is an outline of the window tracery of the cloisters at Trèves. The unopposed circularity of the forms is most unpleasant, whereas this could be easily corrected by a slight alteration, in which the principle of contrast is introduced. The pointed arch is in itself an instance of the value of contrast, the point of the arch enhancing the value of the smooth curves at its sides. Lastly, contrast of richness of detail with severity is also a principle common in painting and architecture, well instanced by the beautiful effect of the twin towers and spires of Chartres, the one so elaborate, the other so unpretentiously simple, and each assisting the other. The next of the painter's working laws is that of interchange. All good pictures are divided into broad masses of tone and colour. Say, for simplicity's sake, that a picture is divided into two unequal parts of light and shade, then the law of interchange means that, to prevent monotony, it will be advisable to carry a portion of the light into the dark, and a portion of the dark into the light side. You will find this fully carried out in the works of Rembrandt and Prout. It is not of very immediate application in architecture, but a knowledge of its principles might prove useful in the treatment of interiors. Wonderful effects have been produced by some portion of a church interior being kept intentionally darkened, and a small portion of light sparingly admitted. A lamp, pulpit, desk, or pillar may often accidentally serve the purpose of carrying down a patch of light into a sombre background, and it might perhaps be worth while to study the impressiveness of the cause of some of these effects. The principle is also, to some extent, applicable to decorative design, and certainly to the treatment of all reliefs intended to produce an effect at a long distance. Closely connected with this subject of interchange is one which is far more important, both to the painter and to the architect. It is that of the essential forms of darks and lights. If you stand at a sufficient distance from a really good picture to be unable to make out the subject, you will find the patches of dark and light colour still resolve themselves into beautiful shapes. This is one of the most unerring tests of a good picture. At the same time the matter is one which it is difficult to say very much about, because the question at once arises, What is a beautiful form? The conditions which make a form beautiful cannot, of course, be described or laid down. It is as impossible to describe a beautiful form in words as to describe an agreeable scent, or a pleasing set of musical harmonies. At the same time—though there may be some differences of individual feeling and opinion, and though fashion and education may have something to do with the matter—there is a general agreement of opinion about the beauty of certain kinds of forms and the ugliness of certain other kinds. The point which must be insisted upon is, that as the painter finds it of the utmost importance to devote his closest attention and discrimination to the essential forms of the darks and lights in his picture, so it is probably not less important to the architect to do so. It seems that modern architects very often design a window, a niche, or a piece of sculptured foliage, without sufficient reference to the form of the resultant lights and darks; and a little study of the question would, therefore, be of almost as

much help to the architect as to the painter. As to the method of study, it can only be suggested (and suggested very deferentially) that the architect should do what the painter does, and endeavour to saturate his eye with beautiful forms, and those produced by the great masters in painting and sculpture. Let him take even one picture by Rembrandt, or Turner, he will discover a wealth of essential forms in it which will remain impressed upon his mind and assist his hand in the next piece of designing he carries out. These essential forms, and the power to appreciate and select them from nature, to re-combine them and develop them, are some of the inheritances of art which have come down to us through the generations, and no wise man would neglect to study what his predecessors have done in the collection and emphasis of such forms. A great genius is as much distinguished by his appreciation of them as anything else, and the power of analysing or re-combining them is the power above all others which stamps a man as a great artist. In connection with this it might be interesting to note carefully the treatment which architectural subjects have received at the hands of some of the great painters who have dealt with them, such men, for instance, as Prout, Turner, Bonnington, and especially David Roberts, a man who had the greatest feeling for form, though his colour and texture have somewhat impaired his reputation as a painter, Such men usually find out the weak points of a building, in regard to essential forms of light and shade, and do their best in their drawings to render them more harmonious by various artifices, many of which would be easily discernible to the practised architectural eye. Now and then a useful hint might perhaps be gained. Let us now pass to what are known as quality and handling in painting, and which in architecture have their counterpart in texture. An otherwise good picture is often ruined by sameness and monotony of quality and handling. The same thing often happens to a building. The design is good, the proportions are pleasant, the building has an interesting plan, which shows itself in an interesting exterior, and it is full of beautiful detail; but there is something wanting, a something which is especially felt by the artistically-educated eye of the painter. That something is texture, or what is perhaps better described as variety of texture. In a picture it is essential that different kinds of things or substances should be painted with a different touch, that some should be expressed with smooth sweeps of the brush, others by roughness and loading of the pigment, and others by transparency or crispness of handling. The object is not merely better to express the substances; but to give variety of texture. The law of contrast will here be of great use to the architect. By using contrasts of surface he can make the textures of his stone, brick, metal, glass, or other material to which he is confined more pleasing to the eye, and he can save his building from the charge of monotony. He can, for instance, add greatly to the charm of a comparatively smooth and well-finished stone surface of a façade by surmounting it by a roof of deliciously rough and irregularly split tiles or shingles. One may often notice the extraordinary charm which is given to the plainest and otherwise most uninteresting of cottages in some parts of Wales and the valley of the Loire by the contrast of texture obtained by a rough shingle roof. And the same thing is to be seen in the Romanesque churches of the Angoulême and Puy de Dôme districts. On the other hand, the charm does not lie in the mere roughness, for buildings which are rough all over are often wearisomely monotonous. A rough surface is always more interesting than a smooth one; but one can have too much of it. When it is considered how great a variety of materials the architect has at his command, and in how many ways their surfaces can be finished (or left unfinished), it is evident that the opportunities for obtaining variety of texture are very large. Contrasts of texture can, moreover, not only be obtained by using various materials, but also by opposing reticulated to plain surfaces, by relieving rich ornamentation (which at a distance gives roughness of texture) with spaces of quietude and relative smoothness. One of the chief advantages of old buildings over new is in the delightful contrasts of texture which they almost always possess, and it goes to the heart of the painter to see these often, too often needlessly, obliterated by the kind of restoration which loves to scrape everything down to the dead level of smoothness and monotony. There is one point in connection with texture which is perhaps worth noting. A rough texture is held by many painters to be suggestive of warmth, in the same way that the etched line with its slightly ragged edge is said to be a warm line in comparison with the perfect and sharp cut line of an engraving. It is difficult to assign a cause for this, but experiment will prove that it is the case. If so, perhaps the fact is worth the architect's attention when he wishes to make parts of a building suggestive either of coolness or of warmth. It may, perhaps, be well to quote a few happy examples of carefully adjusted contrasts and harmonies of texture. Taking, for instance, the well-known porches at Amiens. The lowest portion of the design has a very quiet surface, produced by extremely delicate diapering. Above, slightly more roughness is obtained by larger quatrefoils and foliations in very low relief. These two surfaces help to set off with great effect the bold statues of the porch, whose deeply cut shadows give, at a little distance, the roughest possible texture. Other forcible examples may be found in Spanish buildings, especially in the Alcazar in Seville. Plain rusticated masonry is often there used in contrast with very elaborate surface ornamentation immediately above it, then succeeds a space of absolutely smooth surface, and again a band of delicate ornament surrounding the windows before the roof, with its rough tiles, is reached. Much of the artistic effect of Moorish architecture evidently depends upon texture contrasts. In St. Mark's at Venice the principle is also very obviously at work, and in the Romanesque churches of Central Europe and some of our own Norman ones reticulation contrasted with flat masonry forms a valuable help to the artistic effect of the buildings. In the matter of contrasts of texture, as in all questions of contrast, the principle must not be pushed too far, for contrast is a keen-edged weapon, and may cut too deeply if not handled with care. Hitherto the omission in modern buildings (from the painter's point of view) has been quite as much the omission to give sufficient texture as the omission of contrast. This is, as you see, only a view of the pictorial principles of composition. There are many others equally, or still more, interesting to the painter. For instance, the strange influence of diagonal lines upon a composition might have been referred to, a principle greatly insisted upon by French painters. Of some of the principles affecting tone and breadth, consistency, as opposed to contrast, the difference between geometric and artistic symmetry, relationships of tone, means of harmonising systems of curvature, the value of concentration, of focussing in detail, insubordination of parts, and its remedies, curvature and other matters, I might and should like to say much; but time will not permit. There is only one more point to touch upon, and that is individuality. Individuality, in painting, can hardly be described as a law or principle, but it is rather a quality. It is a quality which has, perhaps, never been more sought for and appreciated than at the present day. Whether this is a good or a bad tendency is an open question, but it is, on the whole, a right one. Interest in the subject of a picture has to some extent declined, whereas interest in the way in which the subject is treated, or, in other words, in the individuality of the artist, is increased. It has been realised that what the painter thinks about a subject is perhaps of as much value as the subject itself, and a picture or a statue is desired quite as much because it is the work of a particular man as because it is an artistic rendering of some particular subject. The mere desire to possess the works of a particular artist because he has a great name is also a factor in the question, but this is not so unhealthy a tendency as is often implied. If a man has a great name he has probably earned it, and there is some characteristic about his work which is not to be found in that of others. It is, in fact, stamped with a certain individuality. Painters have recognised this fact, and it has led them to give more play to their own particular feelings and ideas, choice of subjects, and methods of execution. Would it not perhaps be well for architects to be less afraid of following the tendency of the times in this respect, and to give more freedom to the expression of their likes and dislikes? The public has very clearly, and perhaps rightly, expressed its appreciation of originality and individuality in architectural design, by its support of those architects who have adopted this course, and the names of many of whom will at once occur to you. There may be dangers in this, but they are the dangers of artistic progress, rather than the dangers of artistic stagnation. Is it not justifiable to wish to possess a building designed by a certain artist and stamped with his individuality, the touch of his pencil visible in the delicate design of its detail, or his feeling for light and shade expressed in bold shadows and carefully considered forms of its projections or its piercings? One word more as to the apparent complexity of some of the principles to which reference has been made, and which it might seem might tend to confuse rather than to help the designer. It is not so much in working out a design that they may be of use, as in criticising it and correcting its defects. As in a picture so also in an architectural design, it must frequently be felt by the designer that something is wrong, but he does not exactly know what. Let him recall some of the laws which we have been examining and see whether his work is not suffering from some one or more of them having been broken through. In practice, moreover, they are much simpler than when put into words. We have hitherto been considering the subject from a painter's point of view, and have been assuming that the architect may take some hints from his working theories. It may be added, in conclusion, that it is evident that the painter has quite as much to learn from the architect. There are many artistic qualities in the work of most architects which the painter would do well to lay to heart. Such qualities, for instance, as reserve, definiteness of purpose, dignity of aim, absence of sensationalism, grandeur and impressiveness of sentiment. What picture can produce an effect compared to that of a great church interior or of the bold and massive forms of some great architectural building rising from the wide-spread lowlands, or the steep side of a mountainous valley? There are, it is perfectly clear, a hundred things which we painters can learn from your great historic profession, and some of us are not unconscious of the fact.

Mr. James Orrock, P.R.I., proposed a hearty vote of thanks to the lecturer, remarking that Mr. Rimmington was well known to all artists as one who was steadily progressing in his peculiar line as an etcher. He had been struck with the author's painstaking pursuit of truth. He had that evening brought before them many of the laws which governed painters in their art and had applied them with apt illustrations to architure. One principle seemed to have been omitted, that of the distribution of quantities in a work, and the value of individuality had, perhaps, been pressed too far; what was termed individuality was often merely eccentricity. Still as a water-colourist, a collector, and a connoisseur, he had listened to the lecture with much enjoyment.

Mr. A. R. G. Fenning seconded the vote of thanks, remarking that a thorough grasp of the subject had been displayed in the paper, while in his works, hung in that room, the author had proved that his knowledge was not merely theoretical.

The Rev. P. S. O'Brien, D.D., thought that many of the principles laid down by Mr. Rimmington could be acted upon with advantage by the preacher as well as by the architect, and the primary importance of predominance, continuity, and radiation could be illustrated in the pulpit as well as on the easel or architect's drawing-board. He referred to the niggardliness with which we spend money on architecture, and to the utilitarian spirit of the age, both of which would be lessened were such lectures as they had heard widely made known.

Mr. William Allport said one great advantage of such a lecture was that it enabled the outsider to say why this picture was good and that one poor, as it gave him the reasons why certain modes of treatment were adopted. If we examined any of the elder Pugin's compositions we should find the lines radiating from a common centre very marked, and should also perceive a well-defined predominating feature.

Mr. Alfred Goodman said the distinction between individuality and eccentricity was that the latter turned on an axis outside itself, whereas the former acted from within. The difficulty with architects was that they were restrained in developing their individuality by

many considerations—by clients, the builder and his men, and questions of cost. It was well when designs were prepared by one man, for when two or more were engaged on the work a compromise was adopted, and the work lost the impress of originality. It was preferable for this reason that an asssessor should act as judge in an architectural competition than that the designs should be submitted to a committee, for in the latter case different persons wished for different modes of treatment, and the selected plan was the result of a compromise. Again, the architect was at a disadvantage as compared with the painter, in that his work was not limited by a frame, but had to stand its chance in the street of buildings which might afterwards be placed against it. The observance of the mechanical laws which had been stated by the lecturer could not give a man taste or power as an artist, but would show him why a thing was right or wrong.

The Chairman said he was glad to hear the last speaker advocate as an amateur that competitions should be adjudicated on by a single architect rather than a committee. This was a growing practice, and was the case in the Sheffield municipal buildings' competition, the fairest one yet arranged, and one in which the profession had the fullest confidence in, and universal respect for, the assessor, Mr. Waterhouse.

Mr. Rimmington briefly replied, remarking that he had not dwelt on the relation of quantities in composition on account of the demands of time, demands which had compelled him to sketch his subject in a very superficial manner. He had, perhaps, overstated the importance of individuality; but the tendency of the day was for men to follow and copy each other. Doubtless the quality was liable to lapse into eccentricity, but it was certain that those buildings which were most widely admired were marked by great individuality of treatment. As had been well said, architecture was greatly hampered by conditions; the architect had little or no control over the scale, surroundings, and cost of the buildings he was called on to design, and was greatly fettered by the building owner, and even the contractor. Still, he would suggest that intimate knowledge of these laws would be of some value to the architect, if only as a means of self-criticism of his designs. The work of the decorator was making vast strides, and it seemed that before long the painter and architect would be working side by side, as in the great days of old.

ROYAL ACADEMY PRIZES.

We publish herewith the official list of the awards of prizes at the Royal Academy on Tuesday last. The competitive works have been on public view during the week, and although the paintings and sculpture may be described as of an unusually high standard of merit, the architectural designs and drawings shown are far below the average. If these poor drawings are to be taken as the present standard of the Royal Academy Architectural Schools, it is evident that some reformation will soon be necessary. Both the compositions shown, as well as the manner in which they are delineated, exhibit a great falling off, while not a few of the drawings and designs are as weak and puerile as they can very well be. The Gold Medal and Travelling Studentship for Architecture, value £200, have gone begging this year, only two mediocre designs having been submitted in competition for this valuable and attractive prize. The Silver Medals for Measured Drawings have been won by two sets illustrating the Great Hall at Hampton Court Palace, the first prize being taken by an unfinished series of rather well-drawn details. The subject, though rich and famous, is not particularly well adapted nor effective for such a contest. The prize students' work for the last two years may be classed among the most attractive portion of this week's exhibition, though of these drawings also it must be said, they are not equal to the high degree of merit often noted on previous occasions. Mr. R. W. Schultz, the Gold Medal and Travelling Student for Architecture for 1887, shows some measured drawings of San Miniato al Monte at Florence, the pulpit in the church of San Ambrozio, Milan (very charmingly detailed in pencil), some mosaics and carvings from the Baptisteries of Florence and Pisa, some measured sheets of the Cathedral at Athens, the Kapnikarea Church there, and a church at Daphne. The sheet of enriched capitals from the Narthex of St. Mark's, Venice, is also worthy of commendation. Mr. Arthur Jemmett, the English Travelling Student for Architecture for 1888, is scarcely so happy in the work he shows. For instance, the measured sketches of the courtyard at Compton Winyates, as well as the sketch from the garden front of the same house, are not a success. This is to be regretted, for the subject could not be surpassed for interest, and, so far as we are aware, has not been properly measured up yet. His other drawings give sepia views from Christ Church, Ely Cathedral, and Romsey Abbey. Mr. George Frampton, the Gold Medallist and travelling Student Sculptor for 1887, is to be congratulated on his full-length statue of a youth bearing a lamp and over his shoulder a scythe. On his head are the wings of a bird brought round over the face, casting an effective shadow. The pose and lithesome vigour of the figure are admirable, and the modelling is good; but we do not know the title given to the composition. His low relief of St. Christiana, in a gold Ionic frame, is delicately designed, and suggestive of more detail, though we prefer the bronze bust, by the same skilful hand, of Christabel, on the other side of the gallery. The Travelling and Gold Medal Student for Painting, 1887, Mr. A. T. Nowell, sends in, besides a large landscape and figure painting, some studies rather crude in colour from Venice; the Mosque, Cordova; some bits from the Alhambra, and mural figure decorations from Italy. Although we cannot praise the architectural competitive work exhibited, the sculpture shown seems much more interesting, and Mr. W. Gascombe John, the winner of the Gold Medal of the year, has distinguished himself by his group of an old blind man seated with his dying boy upon his knee, the subject thus rendered being entitled "Parting." The technical skill of the artist is illustrated by the manner in which he has treated the flesh and modelling of the toil-worn old man in contrast to the soft, undulating form of the youth, and his power as a sculptor is realised in the anxious glance of the agonised though resigned parent, whose head, bent forward over his child, seems to listen for his parting breath, or, possibly, hoping against hope, to catch the sound of long-looked-for help even at the eleventh hour. Mr. John comes from Cardiff Castle, and has worked under Mr. Thomas Nicholls, the sculptor, to whom no doubt he owes much of his training, though he has since been to Greece, aided by the assistance of Lord Bute. Miss Gertrude E. Demain Hammond had no serious competitor for the prize of £40 offered for the design of a portion of a frieze of a public building, entitled a "Harvest Festival." Her cartoon, giving the principal figures full size, is one of the best specimens of chalk-drawing shown this year, and if the composition itself is not marked by any special decorative originality, there is much good drapery and figure-work contained in it, and the design serves to show what a lady-artist may do in the way of successful decoration. The silver medal and £25 offered for a draped figure (Lady Macbeth walking in her sleep), was well competed for; but the judges could have had but little difficulty in awarding the prize to Mr. Paul Raphael Montford. The success of the year clearly is the landscape-painting by Miss Elizabeth M. Nichol, for which the Creswick Prize (£30) has been awarded. The subject is "The Angler's Haunt," and we have seldom seen a more charming picture. Miss Helen Margaret Plews ranks as *proxime accessit* with a very good work, on which she is to be congratulated. There were about twenty competitors.

The following is a list of the students to whom prizes were awarded:—Historical painting—"An Episode of the Deluge," gold medal and travelling studentship (£200), Herbert James Draper. Landscape painting—"Morning: 'Hail, smiling morn,'" Turner gold medal and scholarship (£50), Ursula Wood; *proxime accessit*, Frank Dickson. Landscape painting—"The Angler's Haunt," Creswick Prize (30), Elizabeth M. Nichol; *proxime accessit*, Helen Margaret Plews. Painting of a figure from the life—silver medal, first, John Henry Frederick Bacon; silver medal, second, Stephen Briggs Carlill. Painting of a head from life—silver medal, first, Elizabeth M. Nichol; silver medal, second, Robert Ambrose Dudley. Copy of an oil-painting—Portrait of Philip IV., by Velasquez, silver medal, first, not awarded; silver medal, second, Walter Ernest Spindler. Copy of a landscape—"View of Dolbaddern Castle," by J. M. W. Turner, R.A., silver medal, George Spencer Watson. Cartoon of a draped figure—(Lady Macbeth Walking in Her Sleep), "Macbeth," Act v. sc. 1, silver medal and prize (£25), Paul Raphael Montford. Design in monochrome for a figure picture—"St. Peter Denying Christ," Armitage prizes, first (£30) and bronze medal, Gerald Edward Moira; second (£10), W. T. Maud.* Design for the decoration of a portion of a public building—"A Harvest Festival," prize (£40), Gertrude E. Demain Hammond. Drawing of a figure from the life—silver medal, first, William T. Maud; silver medal, second, Percy Short. Set of six drawings of a figure from the life—first prize (£50), Percy Short; second prize (£25), Stephen Briggs Carlill*; third prize (£15), Francis Joseph Mackenzie; fourth prize (£10), Frederick Dudley Walenn. Drawing of a head from the life—silver medal, first Florence Hannam; silver medal, second, Marion Clarkson. Drawing of a statue or group—silver medal, first, not awarded; silver medal, second, Beatrice Emma Parsons. Drawing of a statue or group—prize (£10), Guy E. Broun Morison. Perspective drawing in outline (open to painters and sculptors only), the "New Staircase at the National Gallery"—silver medal, Helen Sarah Squire. Line engravings of a drawing of a figure from the life—gold medal and prize (£25), no competition. Composition in sculpture—"Parting," gold medal and travelling studentship (£200), William Gascombe John; *proxime accessit*, Henry Charles Fehr. Set of three models of a figure from the life—first prize (£50), John Wenlock Rollins; second prize (£20), Charles John Allen. Model of a design—the "Finding the Body of Abel," first prize (£30), Henry Charles Fehr; second prize (£10), Andrea C. Lucchesi. Design for a medal—saving of life from fire, silver medal, not awarded. Model of a figure from the life—silver medal, first, Thomas Richard Essex; silver medal, second, Sidney Herbert Physick. Model of a statue or group—silver medal, first, not awarded; silver medal, second, Herbert Arthur Horwitz. Model of a statue or group—prize (£10), Reginald Arthur. Design in architecture—public baths, gold medal, and travelling studentship (£200), not awarded. Set of architectural drawings—"The Great Hall, Hampton Court Palace," silver medal, first, George Harry Jacques; silver medal, second, Ernest W M. Wonnacott. Set of architectural designs (Upper School)—prize (£25), Thomas Davison. Set of drawings of an architectural design (Lower School)—prize (£10), Alexander Mackintosh. Perspective drawing in outline (open to architects only)—"Inside of the Chapter-house, Westminster," silver medal, no competition.

The Landseer Scholarships in painting and sculpture of £40 a year each, tenable for two years, given for the best work done in the examination for passing into the second term of studentship, have been awarded—in painting, to Ernest Spence and William T. Maud; in sculpture, to Henry Charles Fehr.

St. Clement's Church, Eastcheap, E.C., having been repaired and decorated under the superintendence of Mr. W. Butterfield, F.S.A., was re-opened on Sunday after Divine service. The organ, originally built by Renatus Harris in 1709, has also been almost entirely reconstructed. After the Great Fire the church was rebuilt from Sir Christopher Wren's designs, and contains the pulpit and sounding-board of that period, and much carving by Grinling Gibbons. The church was rearranged in 1872, as now from Mr. Butterfield's designs.

The new workhouse in Bensham-road, Gateshead-on-Tyne, is approaching completion. It is being built on the pavilion system at a cost of £50,000. Messrs. Morton, Newcombe, and Lister are the architects, and Mr. Walter Scott, of Newcastle, is the contractor. The buildings occupy a site of 22 acres, and include three distinct blocks for the regular inmates, residences for the officials, rooms for the committee, schools for the children, hospitals, a large plunge bath, and shops for joinery, blacksmithing, tailoring, tinsmithing, and shoemaking purposes.

The new workhouse, Cardiff, is nearing completion, and is being warmed and ventilated throughout by means of Shorland's patent warm-air ventilating Manchester grates and open fireplace Manchester stoves, the same being supplied by Mr. E. H. Shorland, of Manchester.

* Disqualified, having received the same prize before.

WAYSIDE NOTES.

ST. SAVIOUR'S, Southwark, is now in a fair way of being restored. The Bishop of Rochester has issued an appeal on behalf of the proposed restoration, and the services of Sir Arthur Blomfield have been retained for the work. The exact steps to be taken are not yet made public; but, doubtless, Sir Arthur has by this time mentally matured a scheme, even if he has not decided upon the details. All we learn from the good bishop's manifesto is that the ignoble nave and nave aisles are to be dealt with as they justly deserve, and that out of their ruins will arise a fairer creation, which, together with the old choir and transepts, is to form the new fane, modern and ancient handiwork blended in "one harmonious whole."

Interesting myself very much in St. Saviour's, and its proposed restoration, I made an effort to renew my memories of the interior of the building, and managed to be present at evening last Sunday. I did not have an opportunity of seeing the famed Lady-chapel, but was charmed again by the beautiful proportions of the internal architecture of the choir, wrought in that peculiarly bold and massive manner that is quite, and only, English, and which never fails to fascinate and captivate our imagination. It is vastly interesting in mere composition, in solidity of workmanship, and in the delicate contouring of its mouldings, which are, withal, large, liberal, and always effective. Really, it is an admirable piece of design, and I would thus early suggest, with all humility, that this portion of the church may well be innocent of the restorer's hands, save for any small and genuine repair that may be necessary, which doesn't seem to be the case, the appearance of the arcades and superimposed architecture giving one the impression that old Gwilt had done a most conscientious and patient work when he essayed to restore the building in the earlier part of the present century.

In ordinary restoration works, the question of what not to do is of far more moment than that of what is to be done. Here it should be quite the reverse. So far as the circumstances of the case seem to justify, the "restoration" should consist, for the most part, of the addition of new work, and is really referable to class No. 5—"imaginative restoration"—in the formulated table I gave on October 11th last. The re-erection of the nave and nave aisles in harmony with the architecture of the choir would seem to be the chief work, the only data on which to base the new design being the existing old portions of the edifice. Anyhow, be this as it may, one feels that in the care of Sir Arthur Blomfield the church has fallen in safe hands, and that attempts at radical alterations, involving interference with the beautiful old work, will not have to be feared, as might have been the case had the restoration been intrusted to other parties. That the old design and material will be reverenced as highly as in Gwilt's day we have every reason for believing, and, unless I am very much mistaken, we shall have less excuse for any exclamation about the restoration of St. Saviour's than about that of any large building that has, of late, been treated to this doubtful and hazardous process. Any works, so long as the venerable stones are lovingly cared for, can only improve. The present nave is a despicable affair, and has been wisely cut off from the old buildings, as a foul thing that is unworthy of the fellowship of true architecture.

There is one style of writing that never fails to please the architect and architectural student in love with their profession. It deals with old churches, and refers now and again to some example in an English town, village, or country-side. By some strange fascination, to be accounted for, perhaps, by the fact that it takes us away from architecture as a bread-winning calling to the love of architecture for its own sake, and that it allures our thoughts from smoky city to breezy common and leafy country lanes—by some power of this kind it never fails to hold our sympathies. I take it, therefore, that the paper which Mr. E. P. Warren recently read before the Architectural Association, was keenly appreciated for this reason. I know that I commenced reading the report of this lecture on "The Colour Decoration of Churches," intending to scan superficially, but quickly found myself deep in a serious perusal that proved enjoyable from beginning to end. As to the moral of the whole, however, the colour decoration of our churches, it is marvellous to reflect upon the extent to which architects are split into two hostile camps on this question. And I must confess to a decided sympathy with the anti-decorators *as regards churches*, whatever else I may feel with respect to secular buildings. Certain I am that no building, the walls of which are covered with artificial colour, can ever impress us with that sense of pure and spiritual beauty and loveliness that we are conscious of when we enter an undecorated church, the internal architecture of which is of honest masonry, rich on its surface with a numberless variety of delicate greys of all tints and tones, whereon in sweet harmony fall great breadths of brilliant, positive colour, that are referable to the bright sun's rays filtering through the stained glass in the clerestory above. How many of us must have taken delight in this, and where would be the effect if the coloured sunlight fell upon an artificially-coloured surface? I have before urged that positive colour in a church should be procured solely and alone through the medium of stained-glass windows, and that the grey neutral tints of the architecture should be recognised as the proper contrast and balance to the bright colour, and it is an opinion I am not likely to change.

I have heard that there was once upon a time a certain well-known architect who, being told that it was proposed to "decorate" a particular church that he had designed, expressed a hope that he might be in his grave when the attempt was made! He was one of a class, doubtless, to whom St. Stephen's Chapel is a horrible nightmare, who have regard to the architecturalism of architecture, and believe that in many cases those who would colour stone architecture would paint a piece of sculpture till it resembles a stray inmate from Madame Tussaud's.

There is one very good point in favour of the decorative artist: he exhibits a laudable desire to regard the exterior as subordinate to the interior of a building, which, of course, it is to an incomparable degree. It is astonishing, though, how few ever reflect upon the relation of interior to exterior. The neglect of internal design for external effect still continues to be a reproach on 19th-century architecture. Outward and visible show is striven for before the attainment of inward and spiritual grace. Yet a noble building is always more beautiful within than without, and an ignoble building is just the reverse. By analogy we can see that this is true. There are buildings that remind one of empty-headed persons—gorgeous without, but barren within. And there are others whose true beauty we only discover when we are admitted within their portals, just as there are men and women whose real worth we only perceive when we have gained their confidence and become aware of their innermost thoughts and aspirations.

The Stockholm municipality have adopted some new building restrictions of a miscellaneous and prosaic description; but among the different clauses is one of more than passing interest, since it is practically an admission on the part of the Stockholm authorities of the urgent necessity to effect something of the same nature that those of us who are Registrationists wish to do in this country. Runs the clause in question: "Houses of brick and stone more than one story in height must not, under a penalty of from 200 to 300 kronor, be erected by others than those who hold certificates from a recognised school of building, or other corresponding technical academy, showing them to have the necessary architectural knowledge. However, the building board is empowered, if recommended, to dispense with such qualifications. Ground-owners are compelled, under a similar penalty, to furnish the name of the architect employed by them in writing to the board before the work is begun, and stating that the latter assumes full responsibility in respect of the work." Stockholm is now miles in advance of London. In the matter of building restrictions the Swedes have long been ahead of this country, and now the gulf becomes more apparent to all. In Swedish towns jerry-building is unknown; in London we have such a state of things that the daily papers are able to get a joke out of their comic men, about houses that "could be demolished with a toothpick"! I must confess that when I advised readers the other day to keep an eye on your Legal Intelligence, I little thought that an illustration of what I desired to demonstrate would so quickly appear. What *are* we coming to?

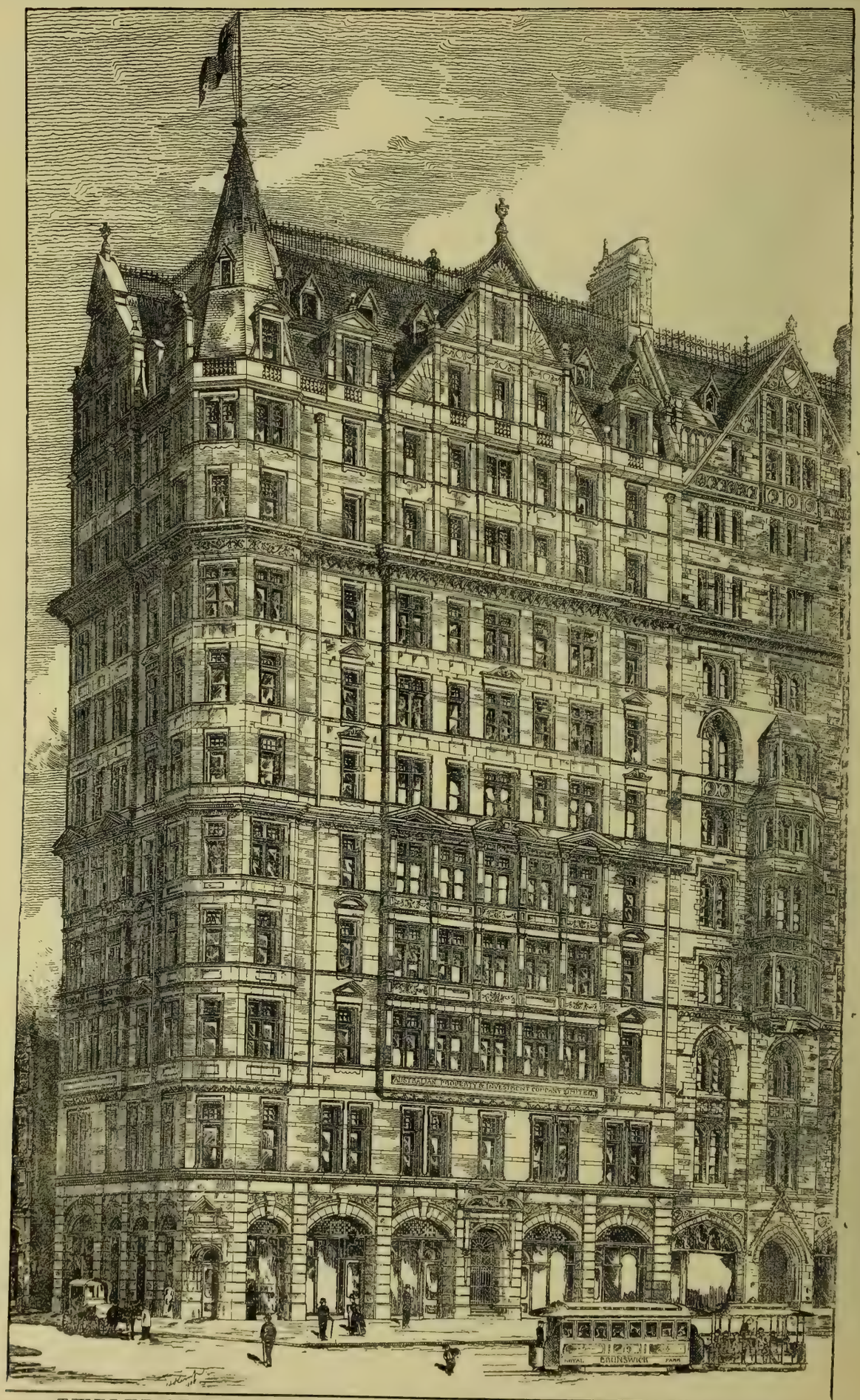
It so happens that two or three days ago I was holding a most interesting conversation with a gentleman who has resided in Sweden for twenty years, and during that time been largely interested in the building trade. I asked him why it was that, whereas here we have rotten buildings all around us, in such places even as Gottenberg, buildings other than those erected with the most perfect constructive soundness are not to be found? He replied that in Sweden, if a building owner contravenes the by-laws, he is liable to have not only the building destroyed, but his ground forfeited to the Municipality; and, further than this, that for minor faults he brings upon himself the whole of the expenses of the supervising city architect and his staff, which, where all goes well, are borne by the public. I suppose, therefore, the gist of the matter is, that England being a "free" country, this freedom at times amounts to the permitting of licentiousness in some things. Yet it remains to be proved whether some of the more stringent building regulations which, in several Continental countries, stamps out the foul jerry-building fungus would not in this country be equally productive of good results.

I do not remember ever regretting more my inability to attend a lecture than I do the one delivered by Mr. A. Wallace Rimmington on Tuesday evening last, before the Society of Architects. From a friend who was present, however, I gather that it was a most successful affair, the meeting being exceptionally well attended, many ladies gracing the company. My reasons for so greatly regretting my unavoidable absence are that Mr. Rimmington has admirably treated a subject which, to the shame of architects, is grossly neglected, and that is, what I have ever endeavoured to press upon my readers, the importance of architectural composition, and of the ethical laws of material beauty. I call Mr. Rimmington's paper magnificent. It does not altogether surprise me, seeing the dumbness of architects themselves in this matter, that the subject should be put before them by one outside their ranks. In broad questions of design, as I have more than once observed, a layman of great artistic intelligence can point out to the architect things which he, wrapt in the contemplation of detail, does not observe; and even blunt public criticism may hold in check the excesses of the professional man. I only hope the council of the Society of Architects will prevail on Mr. Rimmington to continue the consideration of the points he had, on his own confession, no time to touch upon; and may I be there to hear!

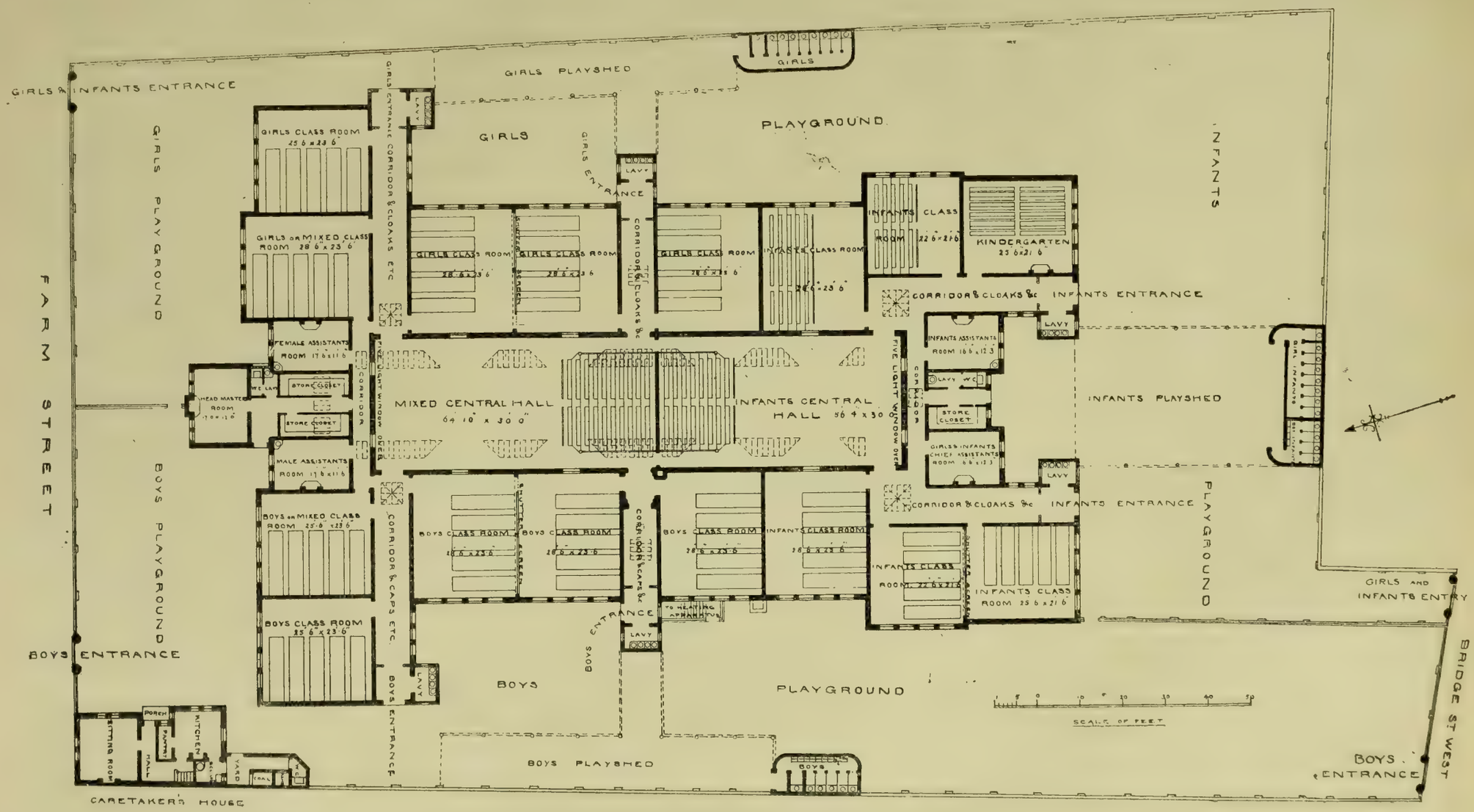
Messrs. Peto's "profit-sharing" scheme seems really a bonâ fide one; but it is faulty in several respects, and will, if not amended, irritate the men in the long-run rather than conciliate them. The rules and regulations governing the men are too many and too vague, and the reservation to the firm of power to make further regulations during the progress of the contract is too one-sided. Then the provision that a representative of the men shall be present at the audit of accounts is hardly guarantee enough. Messrs. Peto themselves are, of course, above suspicion of "cooking" accounts, but all firms are not, and an ordinary workman in the midst of a batch of accountants is a very helpless and suspicious creature. I don't see, moreover, how the Trades Unions can accept the clause against strikes as it stands. Still, the scheme is in many ways so much better than most others of the kind that I should like to see it fairly discussed by those interested, and amended where needful. Judicious "profit-sharing"—regulated neither by masters nor men, but by an independent guild of which both masters and men were members might, I fancy, do something to end strikes, and kill Mr. Buggins, and possibly teach the officials of School Boards and other public authorities to be honest and capable in time.

GOTH.

At the last meeting of the Stockport town council an animated discussion took place on a special committee's recommendation to appoint Mr. John Atkinson borough surveyor, at a salary of £400 a year, being an advance of £270 a year on the salary he is now receiving as an assistant surveyor in the Corporation offices. The recommendation was carried; an amendment that Mr. Atkinson's salary be £250 per year being lost by a large majority.



TWELVE-STORY BUILDING, ELIZABETH STREET, MELBOURNE.



BOARD-SCHOOLS, BURBURY STREET, BIRMINGHAM.

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ILLUSTRATIONS.

SKETCHES FROM SWEDEN AND DENMARK.—SHOPS AT ROSSLYN HILL, HAMPSTEAD.—HINKSEY VICARAGE, OXFORD.—EXAMPLES OF BRITISH AND FOREIGN PEN DRAUGHTSMANSHIP.—RICHMOND HILL CONGREGATIONAL CHURCH, BOURNEMOUTH.—TWELVE-STORY BUILDING, MELBOURNE.—BOARD SCHOOLS, BURBURY-STREET, BIRMINGHAM.

OUR LITHOGRAPHIC ILLUSTRATIONS.

SKETCHES IN SWEDEN AND DENMARK.

St. Peter's Church, Malmö, Sweden.—This is a large brick church in the usual Baltic style, consisting of a nave and aisles, shallow transepts, an apsidal choir, with six radiating chapels, and a lofty western tower. The dimensions over all are about 225ft. long by 68ft. across the transepts. The date of its foundation is given as 1313; and in all its details it resembles a church of the first class, such as were erected in Mecklemburg and Pomerania during the first half of the 14th century, except that the moulded brickwork is not so rich, and there is an entire absence of the carved brickwork so characteristic of the buildings on the other side of the Baltic. There is about the work generally the same solidity and straighforwardness so noticeable in the great churches in Lübeck; and the close commercial intercourse which existed in Mediæval times between the two ports will doubtless account for the great similarity of the buildings in Lübeck and Malmö. The western tower is of massive brickwork, and was surmounted by a lofty gabled spire, blown down in 1442. The angles have quoins of roughly-faced granite blocks, averaging 5ft. by 1ft. 6in. by 1ft. 6in., and across a wide crack on the south side, caused by a settlement, similar blocks have been cut in to bond in the two parted sides and equalise the pressure. The nave is lofty and vaulted in brick, and supported by brick flying buttresses over the aisles; and the transepts, the faces of which are on a line with the aisle walls, rise the full height of the nave roofs, with lofty arcaded gables; but he outlines are pleasingly broken in each side of the nave by boldly-projecting chapels. The gables of these chapels are the most decorated parts of the building, and they, and the windows below them, have the mouldings and cusped panels formed in the black-glazed bricks so common in Lübeck. The apse of St. Peter's also shows the same influence. It consists of five semi-octagonal chapels surrounding a semi-octagon and radiating from its centre, and as each chapel is completely formed, this requires the westernmost flying buttresses to radiate in a westerly direction, producing a most picturesque effect. The apse of the dome at Lübeck was identical with this on plan before its central chapel was lengthened. The whole of the interior is bare, plastered and whitewashed, but the exterior appears to have been restored fairly well. *Roeskilda, Denmark.*—The cathedral church of St. Lucius, Roeskilda, in Seeland, is the most important ecclesiastical building in Denmark, and the principal tomb-house of its kings. It consists of a long nave and aisles, only broken by slighly projecting transepts, and a semicircular apse without any chapels. The length over all is about 270ft., and its width 80ft. The west front has two lofty towers and spires, and the sides of the church have large Late projecting chapels which contain the royal tombs, and quite cover up the old work. The apse is vaulted over the aisle and the clerestory, the latter being lighted by round headed triplets over single windows in the aisles. The whole arrangement of the apse is so simple that Fergusson suggests it to be only the rebuilding of a half of a previous circular church, similar to those of Bornholm. The whole of the building is vaulted throughout in brick, some of which is left exposed, but the greater part is plastered, and has been decorated lately in a very unsatisfactory manner. The original church was consecrated in 1084, and rebuilt or restored after a fire in 1282.—J. Tavenor Perry.

SHOPS AT ROSSLYN-HILL, HAMPSTEAD.

These shops are being erected at the corner of Downshire-hill and Rosslyn-hill, Hampstead, upon the site of some very old and dilapidated houses. The High-street of this rising and fashionable suburb is rapidly becoming a very good shopping neighbourhood, and the latest addition is no disgrace to the locality, which can boast of some very good shop property. The buildings are being erected by Mr. G. Lyford, of 266, Uxbridge-road, W., from the design of Mr. Edward Monson, jun., A.R.I.B.A., of Grosvenor House, The Vale, Acton, W. The external face is red bricks and Dumfries stone, and the roofs are covered with Broseley tiles.

HINKSEY VICARAGE, OXFORD.

This house, of which we give a view from the garden and a plan, requires but little further description. The walls are of brick with stone dressings, and the roofs are covered with tiles. The interior arrangements display good planning, and the wants of a clergyman have been well considered. Mr. H. Wilkinson Moore, of Oxford, is the architect of this vicarage.

EXAMPLES OF PEN DRAUGHTSMANSHIP, BRITISH AND FOREIGN.

The sumptuously got-up volume which Messrs. Macmillan and Co. have this week published on "Pen Drawing and Pen Draughtsmen,"* by Mr. Joseph Pennell, is a thoroughly creditable book, as indeed might be expected from the hand of such an able and artistic worker as the author. No trouble seems to have been spared to make the volume worthy of the occasion, and the printing and paper are excellent. But that which makes the book valuable, of course, is the fact that its writer, as a pictorial delineator of considerable ability, knows in the main exactly what he is talking about, and we can only regret that the pages of this folio are not enhanced by a few of his own drawings, which every one knows and admires. By special permission of the publishers we are enabled to supplement these remarks with a double-page plate of reproductions, giving a series of examples which we have chosen rather with the idea of representing that portion of the subject with which an architectural journal generally has reference, than as attempting to show the comprehensive character of the illustrations to be found in the volume before us. Commencing with a brief essay on the art of pen drawing, which is described as one of the most facile, least understood, and most abused of the arts, the author distinguishes between pen-work and etching, and defines its aims and limitations, adding, in short, that "pen drawing is, was, and ever shall be, drawing with a pen, and nothing more." Of pen drawing in the past he says but little, for the simple reason that there is little to be said, though a knowledge of its immaturity in days gone-by helps one to the appreciation of its development in our own time. The Old Masters were not called upon to develop the art, which to them was only a medium for "sketches of projects and intentions," whereas now a wider scope and higher aims have developed pen-and-ink drawing hitherto quite unknown. Holbein's "Dance of Death," Albert Dürer's and Israel von Meckenen's engravings, Rembrandt's etchings, and the lovely Renaissance decorative head and tail-pieces may of course be studied to the best advantage. In this connection a drawing by Titian is given of a landscape, and also an unsigned study of a figure by Dürer, followed by a head of a child by Vandyke, but no one of these is of great interest. Of pen-and-ink drawings of to-day, Mr. Pennell says he has "selected the best work, so far as I have been able to find it, of all the schools, and not merely of one narrow French, English, Italian, German, Spanish, or American method, the merits or shortcomings of which one would be unable to point out without using this comparative plan" adopted in his treatise. He is "not without hope that the pen drawings published here will show many who are pleased to call themselves pen draughtsmen, that they are without the faintest idea of the aims, objects, and limitations of the art; as well as bringing to the notice of amateurs, collectors, critics, and print-sellers, a healthy, vigorous, flourishing art which is being developed and improved in all its branches, and owes nothing whatever to their fostering care or encouragement." This may be called riding the high horse with great gusto and display; though it may be fairly questioned if such flaunts as these add weight or value to the more practical remarks which accompany the examples throughout the volume. Want of space will prevent us from following these technical observations in detail here, as we wish to note what Mr. Pennell says about architectural drawings later on in his folio. The Spanish and Italian work is represented by Mariano Fortuny, Daniel Vierge, G. Favretto, J. F. Raffaëlli, A. Montalti, Antonio Fabrès, Louis Galice, Ferrand Fau, Martin Rico, E. Tito, and A. Casanova Y. Estorach. We give two drawings from among these by Martin Rico. That in the bottom left-hand corner of our sheet is a sketch from Venice, made expressly for this book, and reproduced by photogravure. Mr. Pennell says of it, "the fact of sunshine is not more evident than the actual position of the sun directly behind the spectator, shown by the direction of every line, which goes to make up a shadow. Notice how he has concentrated his only pure black in the two open windows near the centre of the drawing; and yet he has relieved this black by bits of pure white, in one window by the flowers trained across it, and in the other by the charmingly placed patches of sunlight just behind the half-closed shutter and on the rich decorations which he has indicated, and which we know so well on many Venetian windows. Notice, too, the light giving such value to the darks on both sides of it, which shows through the crack between the window-frame and the shutter; see how the light and shade are managed on the little shrine and on the wall and window under it, and the way in which the light on one wall is carried into the shadow on the other by the arrangement of the foliage. . . . You should also study the manner in which he works out to the edges of the drawing, leading you into it by the most delicate and graceful lines. His architecture is only hinted and suggested; but so thoroughly does he know his Venice that an architect could work from his suggestions, while for an artist they are simply perfect of their kind." The central drawing in the upper part of our plate is another of Rico's studies, and it is considered by Mr. Pennell as one of the best he ever made. He says, "Rico's knowledge of the necessity of concentration is specially notable in the drawing of the Canal with a gondola, in which the inside of the *felze*, or cover of the gondola, is the only pure black; but it is so skilfully managed with little touches of white, suggestions of the carving, the window on the opposite side and the lamp, that you do not see it is a pure black, for your eye is carried at once to the keynote to the whole picture—the large door, which is really not so black as the gondola, but because there are here no opposing whites, it seems, as Rico intended, much blacker." In the section devoted to German work we have illustrations by Adolf Menzel, W. Dietz, H. Schlittgen, Robert Haug, Hermann Lüders, Ludwig Marold, A. Oberländer, Albert Richter, A. Stucki, and Waldemar Frederick; while in the chapter from France we notice specimens of work by Léon Lhermitte, Edouard Detaille, Madeleine Lemaire, P. G. Jeanniot, Louis Leloir, Maxime Lalanne, Ulysse Butin, St. Elme Gautier, H. Scott, Mars, A. Lançon, A. Lalauze, M. de Wylie, Caran, D'Ache. This catalogue will indicate what a variety of work is thus brought together for analysis and study. We give two sketches by Maxime Lalanne, whom Mr. Pennell describes as "one of the most exquisite and refined illustrators of architecture who ever lived. His ability to express a great building, a vast town, or a delicate little landscape, has never been equalled by anybody but Whistler." The studies from his hand are those in the top corners of our illustration. That to the right gives a "Vue du Marché Roermond," and that to the left, "La Porte St.

* "Pen Drawing and Pen Draughtsmen: their Work and their Methods. A Study of the Art to-day, with Technical Suggestions." By Joseph Pennell. (London: Macmillan and Co.)

Antoine, Amsterdam," from "La Hollande à Vol d'Oiseau." The sketch by H. Scott of the clock tower from Chantilly is classified under French work, though it seems uncertain whether he be a Frenchman or not. "He is not a master by any means; but he has done more of this work than anyone else in France. Looking at his drawing, I should say most undoubtedly he was educated as an architect." "In the headpiece at Chantilly the drawing of the flat mansard roof is absolutely expressionless and without character. It is impossible to tell whether it is of slate, shingle, or stone. I suppose it is slate, the material of which all French roofs are built. But there is no reason why a man should make a long series of parallel lines when a few, drawn with discretion, would have shown the material much more plainly. The drawing, or, at least, the reproduction, contains a great number of blacks, thus scattering his effects; but its chief merit is its expression of details, which are very well rendered." Among the French draughtsmen are some few who direct their attention chiefly to the delineation of sculpture, and among these is St. Elme Gautier, whose drawing of "La Génie des Arts" after the high relief by Mercié over one of the doorways of the Louvre, figures in the middle of our photolithograph herewith. Mr. Pennell says: "One cannot call this drawing of Gautier's very artistic; but it is a clean, sharp rendering of the subject, and as such is a good study." The chapter devoted to English pen drawing will be read with enhanced interest from Mr. Pennell writing as an American draughtsman living in London. We regret that we cannot give copious extracts from what he says. The specimens of work illustrated include the names of Frederick Sandys, Ford Madox Brown, E. J. Poynter, R.A., Sir Fredk. Leighton, William Small, W. L. Wyllie, T. Blake Wirgman, Fred. Walker, Geo. du Maurier, Charles Keene, Linley Sambourne, Harry Furniss, George Reid, Walter Crane, Randolph Caldecott, Maurice Griffenhagen, Hugh Thomson, Herbert Railton, Leslie Willson, J. Raven Hill, and Alfred Parsons. America is spoken of as the adopted country of pen drawing, as Spain and Germany were its homes. The following are the names chosen from across the Atlantic for representation: Edwin A. Abbey, C. S. Reinhart, Reginald B. Birch, H. F. Farny, Howard Pyle, Arthur Frost, F. Remington, E. W. Kemble, Alice Barber, Robert Blum, Alfred Brennan, F. Lungren, Harry Fenn, Kenyon Cox, and Wyatt Eaton. Both of these lists necessarily are incomplete, and the task of selecting contemporary work always becomes more or less invidious. The author, however, seldom fails to say what he has to say unhesitatingly, though he does so at times in a dictatorial—we had almost said hectoring—style, suggesting a self-confidence which is by no means pleasing. After all, other people have views equally worthy of consideration, and even if in full enjoyment of a celestial certainty as to the correctness of one's own way of thinking, little, surely, is really gained by indicating how cock-sure one may be. The chapter on Architectural pen drawing gives apt quotations from the works of Phené Spiers, Maurice B. Adams, E. W. Godwin, Wm. Burges, Ernest George, and Walter Millard. The writer, however, says, "Architectural drawing to-day is not artistic." Architects, he tells us, explain that it is not intended to be so, and that "Architectural draughtsmen have opportunities of making artistic drawings, but they seldom take advantage of them. Nor is this, as is sometimes supposed, because exactness prevents their seeing the picturesque, or rather the artistic, side of architectural drawing; the truth is they are often much less exact than artists for the simple reason that they know too much." After a commendatory *réchauffé* from the above authorities, Mr. Pennell says: "Of the architects of to-day, Mr. Ernest George, who has a world-wide reputation among architects as a draughtsman, builds houses which have the most character of their own. This was also the case with Mr. Richardson in America. . . . But to call the slovenly notes by Mr. Street, which may have been useful to himself, an admirable example of a useful drawing, or the checker-board windows of Mr. Norman Shaw's perspectives fine, makes one admire the half-trained, but very ambitious, efforts of a man like Mr. Beresford Pite to cut himself loose from such careless masters." "Mr. Street is responsible for the greater part of the present slovenliness of architectural drawing in England. He not only drew very carelessly, though probably well enough to suit his own ends, but he was one of those men who insist that an architect must do everything for himself, even to the most trifling and mechanical detail. Instead of getting artists to draw his perspectives, he always drew them himself. They may even, if not artistic, have answered his purpose; but, unfortunately, they have given him a reputation of being master of a subject—drawing and sketching—of which he was not even a proficient pupil. The worst of it is, that drawings which he would probably be ashamed to show, were he alive, are published in architectural journals as models for students, with the result that in the last few years, architectural drawing has greatly degenerated." "In looking over years of architectural work, I do not see any drawings which, artistically, can equal those made by professional illustrators who have absolutely no pretensions to architectural science." Architects in America employ such specialists, more to Mr. Pennell's mind it seems, and we are referred to the drawings published by Messrs. McKim, Meade, and White, and Carrere and Hastings. The drawing by Robert Blum of the last-named architects' Alcazar, at St. Augustine, Florida, which we illustrated in the Building News for Dec. 28, 1888, is the only example given by Mr. Pennell in illustration of his remarks on this subject. He adds: "I cannot mention a single architectural draughtsman of to-day whose work I would recommend to students who wish to make artistic pen drawings of architecture. In this connection architects will probably note the omission of several well-known names. I probably know the work of these men as well as architects themselves. But, artistically, it does not compare with that of the illustrators upon whose style theirs is modelled." We think that the writer here shows a conspicuous want of knowledge, however much he may assert to the contrary. For example, not to mention Mr. A. H. Haig's beautiful pen drawings of architecture is an evidence in point. His studies are quite unsurpassed from an architect's point of view; but then Mr. Pennell tells us that architects are only "wanted to restore or ruin whatever little beauty is left in the world," and again, in another place, he hopes that architects will "arrange their system of architectural education so that the coming generation of architects *will know some little about art*" (the italics are ours), "and not become mere business men, with no artistic appreciation of the profession of architecture." Until architecture is practised by painters and sculptors, we are told there will be no artistic house building! "Possibly," he says in conclusion, "architects will suppose that I intend setting up as a rival to Lord Grimthorpe. But the reason I write as I do is because I have such a great respect for artistic architecture. When one sees around one all traces of old London, or rather of old England, disappearing under the puny hands of knighted and titled jerry builders, drain constructors, and sanitary engineers; when the old churches of the City rise up from their beauty, scraped, whitewashed, and rearranged according to the ideas of these decorators, housepainters, and upholsterers, one can do nothing but utter what of course will be an unavailing protest against the unchecked sway of the building trade into which architecture in this country is degenerating." The concluding chapters on "Pen Drawing for Book Decoration," "Materials for Pen Drawing," "Technical Suggestions," and the paper on "Reproduction of Pen Drawing," are much more practical and useful, showing a thorough knowledge of the matter in hand. We finish by reaffirming what we stated at the outset, and although we do not think Mr. Pennell knows much about architecture, his book is an ornament to the library, and will be welcomed by all draughtsmen.

RICHMOND HILL CONGREGATIONAL CHURCH, BOURNEMOUTH.

Like many other churches and public buildings in this popular watering-place, the present Congregational church on this site has grown old and inadequate to the demands of the locality ere it has scarcely attained its majority. It was, therefore, decided in due course that there was no alternative for it but to share a similar fate to some of its predecessors, and give place to a larger and more commodious structure, which now forms the subject of our view. The site might almost be described as approaching the architectural ideal for its purpose, possessing the rare advantages of being central without being too public, and occupying a raised position, which is, at the same time, easily accessible, and it combines many advantages attaching to the question of position in a marked degree. The main objects to be attained by the plan were, first, the accommodation of a large congregation in a compact form; the necessary connection with the existing school and classrooms to the north of the building, and the provision for further school buildings and lecture hall accommodation adjoining. As will be seen by the plans, these essentials are met by the main corridor at the rear communicating at once with the old classrooms and leading to those it is proposed to add at the north-east of the block, this corridor being also in connection with the staircases leading to the lecture halls above and the children's galleries in the transepts, as well as to the lobbies from the vestries to the church on the ground floor. The church proper in this case naturally assumes a somewhat cruciform plan, without any endeavours on the part of the architects towards ecclesiastical precedents; on the other hand, as their principal efforts have been directed to the comfort of the congregation, they have avoided as much as possible any arrangement by which columns would intercept the view of the congregation, and have therefore made the aisles assume the functions of simple gangways, except at a time of emergency, when the space might be made available for extra chair accommodation. The floor is raised towards the south, and the seats arranged in circular form, so that all occupants may more conveniently face the pulpit. The apse is entirely appropriated to the use of the choir, and as the organ-chamber immediately adjoins, the organist and his choir are in perfect touch with each other. The tower is placed at the S.W. angle, forming on the ground floor the principal porch and entrance to the building. In the nave and transepts on the ground floor the building is arranged to accommodate about 900 people, this number being increased to about 1,100 by the sittings provided in end and transept galleries. The building is designed throughout in the spirit of a somewhat Late period of Gothic, the materials being principally Swanage stone walling, with Bath or Portland stone dressings, and most of the old materials that are sound will be incorporated in the new structure. It is proposed to warm the whole building on the hot water circulating system, supplemented by one of warm air to be used when necessary. Fireplaces are, however, provided in most of the classrooms in addition. The ventilation is effected by two extract shafts on each side of the roof, communicating in the one case with the flêche, and the other with the tower, both being provided with a gas cone to promote a proper current and prevent down-draught. The estimated cost is between £10,000 and £11,000; the plans of the architects, Messrs. Lawson and Donkin, of Bournemouth, having been selected in a local competition.

TWELVE-STORY BUILDING, ELIZABETH-STREET, MELBOURNE.

Of the many high buildings recently erected, or in course of erection, in Melbourne, this block, built for the Australian Property and Investment Co. (Limited), will be the highest, rivalling the immense American structures both in height and in appearance. The height from the pavement to the top of the flat roof on the mansard principle is 150ft., and the turret on the angle is about 25ft. higher. The dimensions of the site are 80ft. to Elizabeth-street and 56ft. to Flinders-lane, and as there is a right-of-way at the rear, parallel with Elizabeth-street, it has been possible to cover the whole site and obtain perfect lighting without any areas. The ground floor is entirely taken up by shops, excepting the entrance to offices, and stairs and elevators communicating with the basement and upper floors. The shops have polished walnut fronts with ornamental stained glass in the arched heads. The entrance to the offices, which is closed at night by fine wrought-iron gates, is through walnut spring doors glazed with ornamental glass, opening into a spacious vestibule, from which start the stairs of fire-proof construction (Hawksley's patent), and also two of Waygood's high speed direct-acting hydraulic elevators with unusually spacious cars. The vestibule has also an office for a porter, and a complete arrangement of speaking tubes communicating with each office upstairs. The whole of the upper floors are

of iron construction, without walls, being divided into offices, as may be required, by stud partitions. About 220 offices in all may be provided, and all will be well lighted, and heated by gas stoves. There is a lavatory and convenience on each landing of the staircase, and a number of E.C.'s are placed on the roof. A portion of the floor is planned as a complete photographer's gallery, and the housekeeper's quarters are also on that floor. The materials used in elevations are polished granite from Harcourt and Gabe Island, in alternate courses, from the ground floor up to the first cornice, and above that picked red brick facings with Stawell stone dressings. The building is erected as far as the eighth floor on the level of the main cornice. The roofs, of high pitch, are to be covered with American green slates surmounted by a wrought-iron cresting, and the gables, dormers, and turrets will combine to make the skyline a little more picturesque than that of some other high buildings recently erected. The contract is being carried out by Mr. James Anderson, of Nicholson-street, the amount being £62,000. The architects are Messrs. Oakden, Addison, and Kemp, in conjunction with Mr. J. Beswicke. The adjoining building, of similar height, but Late Gothic design, which is shown on the right-hand side of the picture, is about to be erected in Sydney freestone, from the design and under the superintendence of Messrs. Oakden, Addison, and Kemp, architects, of 2, St. James's Buildings, William-street, Melbourne, to whom we are indebted for our illustration. This description is from the *Building and Engineering Journal* of Melbourne.

BOARD SCHOOLS, BURBURY-STREET, BIRMINGHAM.

THESE schools were at first intended, in accordance with the instructions of the board, to be wholly under the charge of a head-master; but it has since been determined that the infants' department shall be under an independent head-mistress. The plan is arranged on the central-hall system, having, in the mixed department, five classrooms, for 60 each, on the one side, for girls, and a similar number of classrooms for a like number of boys on the other side of hall; and the head-master's room, with rooms for male and female assistants, store-rooms, &c., occupying the space at end of hall between the boys' and girls' classrooms. A short end corridor renders both of the two classrooms, in communication with same, available for either sex, and either of these classrooms can be used for mixed classes, as they have separate access to both boys' and girls' corridors and playgrounds. The infants' department comprises five classrooms for 60 each, and a kindergarten for 68, in addition to a central hall having gallery for 120; there are two rooms for mistresses, with store-room, &c. In carrying out the work, one teachers' room at each end will be omitted, and this will necessitate some other modifications. The total accommodation will be 660 boys and girls and 488 infants, and the estimated cost is not to exceed £8 10s. per head. The architect is Mr. William Hale, F.R.I.B.A., of 83, Colmore-row, Birmingham, whose plans were selected in limited competition.

CHIPS.

The memorial to the Royal Stewarts buried in Paisley Abbey, which has been executed by Mr. John Hutchison, R.S.A., sculptor, Edinburgh, in accordance with a commission by the Queen, has been completed, and was unveiled yesterday (Thursday) by Sir Michael Shaw-Stewart, Bart., Lord-Lieutenant of the county. The memorial takes the form of a sculptured cross similar in style to those at Iona and the Western Isles.

St. Mary's Church, Ilminster, was reopened on Friday, after extensive alterations and improvements. The whole of the church has been refloored, the vaults filled in and concreted, and a new heating apparatus provided. It is intended to replace the old pews with open benches of oak. The work has been done by Mr. A. Poole, of Ilminster, under the supervision of the diocesan architect, Mr. J. D. Sedding. The cost of the alterations will be about £1,500.

The east window of Holy Trinity Church, Hartlepool, has been filled with stained glass. Messrs. Powell Bros., of Park-square, Leeds, designed and executed the work.

A chapel is in course of erection at Fishponds, as a memorial to the late Samuel Morley. Mr. H. J. Rossiter, of Bristol, is the contractor.

SIR FREDERIC LEIGHTON ON SPANISH ART.

THE President of the Royal Academy delivered his biennial address to the students in the Royal Academy Schools on Monday evening, after distributing the prizes in accordance with the list given by us on p. 798 *ante*. Since his accession to the presidential chair at the Academy, Sir Frederic Leighton has made a systematic survey of the history of art the staple of his addresses, and having dealt in his last address, in 1887, with the art of Italy, he now exhaustively treated on that of Spain. In his introductory remarks the President sketched the historical development of the Spanish nation, pointing out that to speak of the Spaniards as a Latin race was to a great extent misleading, for, although conquered and civilised by Rome, the people, who in the 15th century first appeared on the stage of history as a political unity under Ferdinand and Isabella, showed but faint traces of Latin kinship, and offered the most thorough contrast to the Italians of the same period. Nor need that surprise them, for seldom was a race composed of elements more heterogeneous, the Iberian basis was added to by an influx of Celtic blood, while in its eastern provinces Greeks, Phœnicians, and Carthaginians contributed further foreign elements. Rome, in her turn, laid strong hands on the land, retaining her grasp upon it till the beginning of the 5th century, when the Gothic race pushed southward into Spain, and founded a powerful State, embracing the larger portion of the Peninsula and a wide tract in the south of France. With the advent of this Gothic race the modern history of Spain began. Four hundred years later the Moors invaded and subdued the whole land, a conquest pregnant with far-reaching results. Sir Frederic traced in detail the story of the freeing of the land from Arab rule, and the successive foundations of the kingdoms of Leon, Castile, and Aragon, the union of the latter provinces being followed by the final expulsion of the Moors. One of the main causes of the deep and radical differences dividing the development and character of the civilisation of Italy from that of Spain was that whereas the history of Italy was during the period of her greatest intellectual vitality the history of a repeatedly-invited foreign yoke, the annals of Spain, up to the 15th century, were the story of a struggle to shake off an alien master. In art, the Arabs left many a mark behind them; many an Eastern form and feature was to be found adopted in the architecture of Spain—the Ajimez window, for instance, a type of dainty elegance, the deep architraves of their circular-headed doors, their woodwork, their treatment of plaster, and their decorative use of tiles; nay, indeed, a new style, the Mudejar, was built up of Muslim and Christian forms. We had, however, this curious fact to note—that whatever of Eastern elegance and charm was absorbed into the Andalusian nature found little, if any, expression in Spanish art; that spirit of exquisiteness which breathed in every work of Arab hands was ever foreign to the Spanish artist. Having contrasted the physical conditions of the Andalusian and the Castilian regions, and referred to the literature of Spain, the President pointed out that Spanish art as a whole was the product of a nation in whom æsthetic ideals were entirely wanting. The art of Spain was, at the outset, wholly borrowed, and from various sources; heterogeneous, borrowed elements were assimilated sometimes, frequently flung together in illogical confusion, seldom if ever fused into a new harmonious whole by that inner welding fire which was genius; and in the 16th century a foreign influence was received and borne as a yoke, because no living generative force was there to throw it oft, with results too often dreary beyond measure; and finally they met with this strange freak of nature—a soil without artistic initiative bringing forth the greatest imitator—he did not say the greatest artist—the greatest imitator perhaps since Leonardo in modern art, except it were his contemporary Rembrandt, Diego Velazquez. Describing next the fortunes of the several arts in Spain, Sir Frederic commenced with the consideration of its architecture. Those who desire, the President continued, further acquaintance with the Gothic architecture of Spain have access to it in the work of an artist of genius, and a man of learning, in whom the Academy not long ago lost an honoured member, Mr. G. E. Street. In using his work, however, you must make allowance for a vehement impatience of whatever does not fall within certain forms of art, and must not be unduly terrified by the word "Pagan." You will there read how, from the earliest times, a foreign influence was stamped on the work of the church-building Spanish race, an inspiration sometimes Romanesque and sometimes Byzantine in character, sometimes Aquitanian and sometimes Burgundian; Lombard Italy, too, we shall find here and there contributing a feature. In Leon we see later on a cathedral more purely French in character and design than any other in Spain; yet later, German elements, especially in ornament, are everywhere met. Finally, the Renaissance movement—to Italy the source of her highest achievements, but to Spain a baneful influence enough—asserted itself here as elsewhere. Now, in this summary enumeration the dominant influence in Spanish architecture up to the 16th century was French, and this early French supremacy will not surprise you when you consider that the boundary of Spain was not then as now the Pyrenean range, and that the Spanish clergy was largely recruited from France. This circumstance contrasts with the preponderating influence of Flemish art which we shall note when we speak of Spanish painting, and marks the absence of any definite indigenous impulse. And of this want you will be made further conscious when on closer examination of the chronology of Spanish architecture you mark the simultaneous erection of buildings denoting in their character different periods, and when you see details of different and antagonistic styles picturesquely but incongruously elbowing one another in the same edifice, and become aware of the absence of any such continuous and organic development of a style as you witness, for instance, in the Gothic architecture of your own country. Nevertheless, while the Spaniards lacked the originating impulse in art, their ecclesiastical architecture was, even at an early date, often beautiful, and always striking. We owe to St. James indirectly the earliest of the great cathedrals which are the just boast of Spain, the Church of Santiago de Compostella, the work, however, not of a Spanish, but of a French architect, and, in fact, the twin design of St. Sernin at Toulouse. A cast of its famous "Portico de la Gloria" is familiar at South Kensington Museum. We much miss in Spain any definite process of architectural evolution; an exception should, however, to some extent be made in Catalonia, where a local style of pointed Gothic was formed of a distinctive and striking character. Again, there is in Castile a group of churches in which the addition of external open arcades—sometimes, as in the case of San Vicente at Avila, on one flank, sometimes, as in the churches of Segovia, on two—has the happiest effect, and may be said to constitute a type proper to this region. And the Spaniards, whatever their æsthetic limitations, seized with an incomparably more powerful grip on the Gothic idea than ever did the Italians. I know of few things more curious than the absolute inability of the latter—the most shrewd and subtly-gifted people of their day, and saturated with the artistic sense—to grasp the spirit of Gothic architecture. Certain Gothic forms, indeed, they adopted; they pointed the openings with which, in obedience to their native instincts, they sparsely pierced the broad spaces of their walls; they made liberal use of crockets and unmeaning pinnacles; they accepted the vault, which is called the formative principle of Gothic building; but to the seed of life that lay in the principle of the vault they remained blind. Though you do not find in Spain the superbly logical development of this Frankish style that characterises the country of its birth, you do find the Spaniard alive to its vital conditions, and treating it as a plastic malleable thing; and you find him further imparting to it—for good or for evil—a strong impress of his own idiosyncrasy. The churches which mark the first centuries of the partially-recovered independence of his country are instinct with the gloomy fervour and the masculine sobriety of his race. I know no two churches in any land in which this quality of masculine sobriety has more powerfully impressed me than the cathedrals of Taragona and of Avila. The former is artistically the completer work in its more perfect balance of vigour and elegance, of unadorned spaces and enrichment; but it may be doubted whether the church in Avila, with its apsidal end carved bodily out of a bastion of the old town wall, is not even more impressive. The

simplicity of these early churches is missed in the churches raised or completed during the days of heightened national self-consciousness and greater material prosperity, and gives place often to an unpruned exuberance of ornamentation in which the craving for the excessive, a craving unchastened by restraint of delicate taste, which was rapidly becoming a distinctive Spanish attribute, is strikingly displayed. If in their sacred edifices, the Spaniards fell into decorative incontinence, they were prompted, in part, at least, by the impulse to give without stint their best to the exalting of their faith; and if their tendency to extreme enrichment led to regrettable excesses—to the abuse of gold, for example, and to absolute orgies of gigantic bosses, of flaming crockets, and of exuberant armorial bearings—we owe to it a decorative feature unique in its kind, always striking, and often of great splendour, the retablos. These structures, rising tier upon tier from the backs and flanks of the consecrated table, present in their blending of architecture, sculpture, and painting, a decoration sometimes barbarous, but often in a high degree impressive. To this tendency also we owe the development of the rejas, the noble metal screens which in a Spanish church close not only the choir and the capilla mayor, but also every recessed lateral chapel. These screens, frequently admirable in design, rich and elegant in form, and judiciously relieved with colour and the precious metals, are an absolutely original creation of Spanish art, and conspire with the sumptuous retablos to give to Spanish cathedrals that gorgeousness of aspect in which all others lag far behind them. But if the churches of Spain are gorgeous in their aspect, their splendour is often tempered with a solemn gloom. The withholding of light seems to have been an object of study with the Spanish ecclesiastical architects, and I must believe that this gloom was occasionally produced and gathered up with definite intent to enhance the mystery of the sacrifice at the High Altar. The Renaissance movement in Spain resulted first in a style known as the "Plateresque," the silversmith's style, which bore fruit in some very picturesque, if not very pure, specimens of architecture, but which did not supersede the intricate half-German Gothic at that time in force. On the contrary, the two styles jogged on side by side, often by a friendly compromise, and in most admired confusion, on the suface and in the structure of the same building. Later on a more severely Classic style began to assert itself, but never with results wholly satisfactory; its efforts were frequently feeble and generally unscholarly. One artist, Diego de Siloe, sought in a vast cathedral to blend Classic forms with Gothic construction, and those who wish to see what disastrous results may attend such an attempt in the hands even of a capable man are referred to the cathedral of Granada. On the other hand, if you would see how much a man of mediocre gift may, obeying, perhaps unconsciously, the spirit of his age, embody that spirit in a pile of stone, you will be inclined to view with more interest than is generally vouchsafed to it by artists, the palace-convent of the Escurial. A huge forbidding block of buildings, turning a blind, blank back on the world, raised on a slope hemmed in on three sides by an amphitheatre of barren rocks, admitting light through fewer and smaller openings than ever pierced so large a surface, rigorously bare of any adornment, it seems to gather up in its expression the very essence of crushing, silent, inexorable tyranny. When, in due course, the "Rococo" in art began everywhere to reign, the Spanish itch for the excessive seized on it with avidity, and in the palace of the Marques de dos Aguas, in Valencia, you may see the supreme effort of its most lunatical vagaries. And now, let us turn to the sculpture of the Spaniards, a form of art wherein, as was natural in a people without æsthetic ideals or delicate sense of form, their achievements never reached the highest level, and in which, on the other hand, that strong realistic impulse, which we have seen to be so powerful with them, exercised a fatal influence. This tendency is sometimes startlingly manifest in the carved ornament of their buildings. Nevertheless, the bane of realism did not lay complete hold on the higher forms of sculpture till a later period, and if there is in the earliest work little refinement of workmanship or dignity of style, a marked originality of dramatic treatment is constantly found in it, and with it often a warm touch of pathos and humanity. In a certain most striking sepulchral monument of the 14th century at Zaragoza, a row of stumpy, ill-wrought little figures is made delightful by the spirit of pathetic tenderness which breathes through it. As another instance of poetic feeling I would quote certain angels in the spandrels of the north porch of Barcelona Cathedral; clumsily composed enough within a trefoiled panel, and wholly barbarous in workmanship, their purely artistic value is nil; yet as they leap out from the wall, flinging their heads back and upwards, turning wrapt, yearning faces with ecstasy towards heaven, whilst they sing and strike their lutes, they seem to fill the air with their soaring song of praise. Of the sculpture produced in Spain in the 15th century the most marvellous examples are the retablo and the tombs which adorn the Cartuja at Burgos, These works, the masterpieces of Gil de Siloe, are miracles of ingenious intricacy and delicate workmanship, and withal extremely fine in design. They are, however, absolutely German in character, and can therefore only be regarded as sources, not as specimens, of Spanish art. In another branch of sculpture, again, to wit, in their gurgoyles and grotesques, the Spaniards found a vent for their sense of the humorous. It is to the sumptuous retablos that we have to trace during the 15th and 16th centuries the peculiar development of Spanish sculpture, the greater part of which has wood for its material. A few Spanish sculptors worked in marble, but none rose to a high degree of excellence. Alonzo Berruguete, indeed, a pupil of Michael Angelo, has a great reputation, but one which his lumbering and mannered works assuredly do not justify. The two most famous monuments executed in Spain in the Renaissance period are, perhaps, the Royal tombs at Granada, and that of young Prince Juan in Avila. They are, however, the work of foreigners. An impenetrable mystery hangs over the history of Spanish painting till the end of the 15th century. A not inconsiderable catalogue of names has, indeed, been handed down to us, and in a few cases a signature or a document enables us to connect one or the other of them with a particular work; but beyond this all is more or less vague conjecture. The invasion of Italianism in the 16th century had the effect of blotting out all that had been till then achieved. Before the end of the century everything in painting that was not Italian in its inspiration, or bore the marks of the old Northern tradition, was repudiated as barbarous, with the result that to this day the great majority of the paintings of the 15th century which enrich the churches or cloisters of Spain are indifferently and half-contemptuously tossed over to the category known as the "Escuela Flamenca." Whatever of pictorial art may have been produced in Spain previous to the 15th century, very little of it has been preserved, and that little mainly in Catalonia. In the work of this period a remarkable tendency, already, to intensity of tone and vehemence of colour has struck me, a quality which is universal in Spanish art up to the 16th century. With regard to the foreign influence that may be traced in them, it would be difficult to generalise with confidence. When, however, we reach the end of the 15th century our task, though still a delicate one, becomes much easier. Of French influences it may be broadly said that outside Catalonia they are mainly traceable in the northern region of the Peninsula. In the work of that admirable Catalan artist, Luis Dalman, the French inspiration is at least mingled with that of Flanders. Of the influence of Italy, although as we know Starnina, and later on Dello, amongst other Italian artists, resided in Spain, I find, beyond certain frescoes at Toledo, but few traces. Flemish example, on the other hand, was paramount. In Castile at this period it was in a manner official. Three Flemish artists were, according to Justi, employed at the Court of Isabel Catolica. Not only were Flemish painters patronised in high places, but Flemish works of art were largely imported into Spain, and a wholly Northern, Gothic character was stamped on the Spanish school; men of vigorous personality bowed submissively to the yoke. Pedro de Cordoba, Sanchez de Castro, Fernan Gallegas, Alejo Fernandez himself, proclaim in every stroke their debt to the Low Countries; nevertheless, a strong racial spice and flavour was in every case added to the Flemish basis, and we wonder with regret what new development might have ripened in Spanish painting if it had known how to withstand an influence so foreign to its instincts as that of the Italian Renaissance. Most conspicuous among these Gothic painters is Alejo Fernandez. In Santa Ana in Triana, at Seville, you may see a Virgin and Child from his hand which in its splendour of tone and general majesty of aspect is a work of a very high order. An exception, perhaps, to the general rule of Flemish affiliation may be noted in a striking series of pictures in the Madrid Gallery, assigned to Pedro Berruguete, the father of the sculptor, which, though strongly Spanish in spirit, are Venetian rather than Flemish in tone and aspect, roughly, indeed, reminding us of the works of Carpaccio. The rise of the Renaissance spirit was in Italy an organic evolution; but to Spain that spirit came as a contagion from without, and as a blight. Yet even here the national accent was never obliterated. The foreign influence by assimilated by various individuals with varying results, and throughout the personality of each painter remained unmistakable and distinct. Whatever may be our estimate of such men as Pablo de Cespèdes, Juanes, Morales, Vargas, Roëlas, or El Mudo, the personal distinctiveness of their works cannot be challenged. To one Spanish painter alone did Italy bring unquestionable gain—namely, to Ribera, a powerful artist very incompletely known on this side of the Pyrenees. Ribera was an artist, an Italian; Alonzo Cano was an eclectic with a Spanish accent; Murillo the unequal, now entrancing us with the fused glory of his tones, now repelling us by harshness and commonplace, was truly Spanish no doubt, but had neither the imagination nor the sustained virility of style of the son of the peasant from Estremadura, the completest representative in art of the genius of his race. For a long period Italian painting did not cease to enjoy the favour of the Court; it ceased, however, towards the beginning of the 17th century to exercise that paralysing influence which had marked its first advent; and the ground was cleared for a new impulse from within. At this juncture a man of commanding genius and fearless initiative was given to Spain in the person of Diego Velazquez. In Velazquez, Spanish as he is to the finger-tips, the comprehensiveness seen in Zurbaran is not found. Of Velazquez all was Spanish, but Zurbaran was all Spain. Viewed simply as a painter, the great Sevillian was vastly the superior of the Estremeno. He was in more intimate touch with nature, and none, perhaps, have equalled the swift magic of his brush. On the other hand, depth of feeling, poetry, imagination were refused to him. But if we miss in Velazquez the higher gifts of the imagination, we find him also free from all those blemishes of extravagance which we have so often noted in this land of powerful impulses unrestrained by tact. Whatever gifts may have been refused to Velazquez, in his grave simplicity he is unsurpassed. If fancy seldom lifts him above the level of intimate daily things, neither does she obstruct for him with purple wings the white light of sober truth. In days in which the young Herrera could find favour; in a country in which Churriguera was possible, and euphuism was applauded, he never overstepped the modesty of Nature, nor forgot in art the value of reticent control. I will, in conclusion, touch briefly on one or two points that are of interest, and one that is, perhaps, of warning. First, I would notice the purity and decorum of his art. Yet another virtue of the Spaniards is reflected in his works in an unexpected manner—namely, their sobriety. I cannot pass in silence a circumstance which must be weighed in estimating Velazquez as a man, and which is not without bearing on his art. The virtues of his race, as we have seen, purified his work and gave it dignity; a Spanish foible, though it could not dim his genius, cramped and curtailed its production—namely, a tendency to subordinate everything to the pursuit of Royal favour. The prevalence of this feeling must plead to some extent in mitigation of the tenacity with which Velazquez canvassed—with success, alas!—to obtain at Court a post of an onerous and wholly prosaic character, the office of "Aposentador Mayor," a sort of purveyor and quartermaster—a post demanding all his attention, says Palomino, who goes on to deplore that this exalted office should have deprived the world of so many shining samples of the painter's genius. In the sight of canvases in which the execution of a sketch is married to the full scale of life, we shall, while we bow before the splendid genius which illuminates them, regret the traces of a hurried hand too often revealed in these dazzling products of a giant's scanty

leisure. Truly has it been said, "Art requires the whole man." In conclusion, the President observed: The picture I have traced before you is crowded, inevitably, and I fear to confusion, and yet much has been omitted which might have helped to its better understanding had time furnished me with a larger canvas. It must suffice to me if I have in any way stimulated you to the further consideration of a deeply interesting chapter in the history of art—a chapter which, if we read it aright, teaches us this lesson—that nations, not less than individuals, may, by the insincere pursuit of what is foreign to their temper, be turned from the true path of their artistic development, and may also, by sincerity, be righted and restored.

APPLIED MECHANICS FOR ARCHITECTURAL STUDENTS.—IV.*

By E. Wyndham Tarn.

MOMENTS OF FORCES.

21. WHEN there is a fixed point in a body, and the directions of any forces acting upon the body do not pass through that point, those forces will tend to cause rotation about the fixed point, and the effect of the forces to cause rotation will vary with their distances from the fixed point. Let P and Q be two forces acting upon a body in the

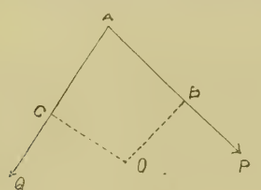


Fig. 21

directions A B and A C (Fig. 21), and suppose O be a fixed or immovable point in the body. Draw O B and O C perpendicular to A B and A C respectively; then P × O B is called the "moment" of the force P about O, and Q × O C the "moment" of Q about O. These two "moments" tend to turn the body round in opposite directions, and if P × O B = Q × O C, the two forces will exactly balance each other, and no rotation will take place.

If the body is a straight rod or beam as A B (Fig. 22), in which there is a fixed point C about which the rod is free to turn, and loads P and Q act perpendicularly to the rod at A and B; then in order that they may be in equilibrium, or exactly balance each other about C, we must have P × A C = Q × B C. If A C is less than B C, then P will be proportionally greater than Q, so that if C is very near to A, a very small load at Q will balance a very large one at A, and this gives us the principle of the lever, and is the basis of all mechanical powers. If it is required to find the load Q at B that will balance the load P at A, we have only to multiply the load P by the length A C and divide by the length B C, and the result is the load Q.

22. The examples of the application of the principle of "moments" in works of construction are very numerous, and we shall here consider a few of them. In a former article (14) we showed how the stability of a wall which was subjected to an oblique force at its summit could be determined by means of the "parallelogram of forces" (Fig. 10). If, instead of forming this diagram, we draw a perpendicular to the direction of P from the point C, the length of which we will call p; then, since K C is perpendicular to the direction of W, if P × p is greater than W × K C, the wall will be overturned about C; but if less, it will be in safety. When P × p exactly equals W × K C, the two forces just balance, and the half-thickness, K C, of the wall can be determined by multiplying the force P by the length of the perpendicular p, and dividing the weight W of the wall.

The principle of moments can also be applied to the lean-to roof, shown in Fig. 4, and described in the first article (8). Here the moment of the forces R and W can be taken about the foot B of the rafter; then in equilibrium we have W × B b = R × a b; and R is the horizontal pressure at B, and can be found by multiplying the weight W by the length B b, and dividing by a b.

The same principle can also be applied to the raking shore against a wall shown in Fig. 8 in the second article (12), where we will suppose a horizontal thrust R to press outwards against the head A of the shore. Taking the moments of R and W about the base B of the shore, we have in equilibrium W × C B = R × A C; consequently the outward thrust R is found by multiplying the weight W by the length C B, and dividing by A C. Conversely, if the outward thrust R is given, then W, the weight of wall necessary to keep the head of the shore from being pushed out, can be found by multiplying the thrust R by the length A C, and dividing by the length C B.

24. Whenever a beam is strained by a transverse load, the principle of the lever enables us

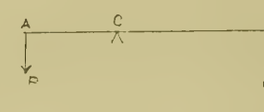


Fig. 22

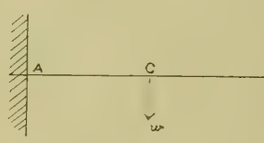


Fig. 23

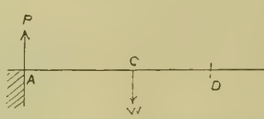


Fig. 24

to determine the "moment of strain" at any point of the loaded beam. Let A B (Fig. 23) represent a beam fixed at one end, A, into an upright wall, and loaded at the other end B with a weight, W. Then if we call M the "moment of strain" about A, caused by the load at B, we have M = W × A B. If instead of putting the whole load W at the extremity B, we put w, equal to half W, at B, and the other half of W at the middle point C of the beam, we have for the moment of strain at A, M = w × A C + w × A B, or M = $\frac{1}{2}$ W × $\frac{3}{2}$ A B = $\frac{3}{4}$ W × A B, so that in this case the strain is one fourth less than when the load W was at B; or to produce the same strain at A we must make W one-third greater. And the larger the number of points on the beam over which the load W is distributed, the greater can that load be made in order to produce the same strain at A. When the load is uniformly distributed over the whole length of the beam, it will bear twice as much load as it would if all the load was at the outer end. This can easily be shown by supposing the load W to be divided into a number of equal parts, and to be hung at four, eight, &c., points on the beam; then the larger the number of points, the nearer will the strain at A be to that produced by half W at B. Thus if one-fourth of W is placed at four equidistant points on the beam A B, then—

$$M = \frac{W}{4} \times \frac{AB}{4} + \frac{W}{4} \times \frac{AB}{2} + \frac{W}{4} \times \frac{3}{4} AB + \frac{W}{4} \times AB = \frac{5}{8} W \times AB,$$

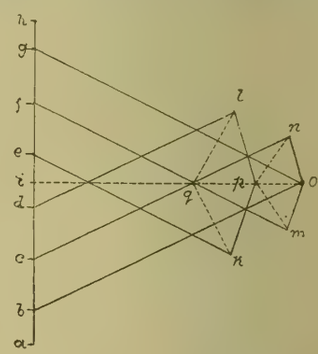
and if it is distributed at eight points, we find in the same way that M = $\frac{9}{16}$ W × A B, and so on.

The moment of strain produced by W at B upon any point along the beam, at C, is W × B C, or the strain at any point is proportional to its distance from B. When W is equally distributed over the whole length of the beam, the effect it produces will be the same as if the whole of W was supported at the centre C of the beam, so that its moment of strain about A is W × A C, or W × $\frac{1}{2}$ A B. If we suppose w to be the load per unit of length distributed over the beam, then W = w × A B, and the moment of strain at A becomes M = $\frac{1}{2}$ w × (A B)². The moment of strain upon any other point C will be M = $\frac{1}{2}$ w × (B C)²; or the strain on the beam at any point varies as the *square* of the distance of that point from B, when the load is uniformly distributed.

25. The strain on a beam A B supported at each end, and loaded at any intermediate point C (Fig. 24) with a weight W, may be determined by supposing P and Q to represent the vertical forces at A and B which would just balance the load W if there were no supports at A and B. Then we can consider the point C where W acts to be a fixed fulcrum, about which the moments of P and Q balance, or P × A C = Q × B C, either of which will, therefore, represent the moment of strain at C. Then if we supposed B to be a fixed fulcrum, and take the moment of P and W about B, we must have in equilibrium P × A B = W × C B, or P = W × $\frac{CB}{AB}$. Also, since P × A C represents the moment of strain at C, we have from the above the moment of strain at C = W × $\frac{AC \times BC}{AB}$, or it is W multiplied by the product of A C and B C, and divided by A B.

The moment of strain at any other point D of the beam is M = W × $\frac{BD \times AC}{AB}$. When the load W is at the centre of the beam, or A C = B C, then M = $\frac{1}{4}$ W × A B is the moment of strain at C, while that at any other point D is $\frac{1}{2}$ W × B D. When the load W is uniformly distributed over the beam supported at both ends, then the moment of strain at any point D is M = $\frac{1}{2}$ W × $\frac{BD \times AD}{AB}$; and if D is the middle point of the beam we have B D = A D = $\frac{1}{2}$ A B, and M = $\frac{1}{8}$ W × A B, which is half the strain produced when the load is at the middle.

[In reply to E. Percy Hinde, the stress diagram (Fig. 17) in paragraph 18 of Article III. is drawn on the assumption that the tensile strain in the tie-rod of the truss in Fig. 16 is uniform throughout its length, which will generally be the case when it is horizontal and forms one straight rod. In larger roofs, however, the tie-rod is often made in separate pieces, and we are favoured by Mr. Hinde with a solution which takes into consideration the varying strains in the tie-rod, as shown by the diagram here-



with. In this case o n is the strain in H D (Fig. 16), and p l that in the strut E I; n p the strain in D I, and l q that in A E. The tensile strain in E F (Fig. 16) will be represented by i o, that in D E and F G by i p, and that in B D and G C by i q.

Both "H. C." and Mr. Black have missed the object we had in view in treating the king and queen truss in the way we did. In the first place, we supposed that there was no strut at E in Fig. 5, or at K in Fig. 6, and then proceeded to consider the action of the load at those points upon the rafter. In the absence of a strut the rafter would bend at the point where the load was applied, consequently it must be subjected to a strain at right angles; and as the only other strain could be down the rafter, the load must be resolved into two forces, one at right angles and the other parallel to the rafter, and it is the former of these that is sustained by the strut. It seems to us that both our correspondents are confusing this case with that of Fig. 3 in

* Some of our correspondents having objected to our statement that the load at E in Fig. 5, and that at K in Fig. 6, causes a transverse strain in the strut as well as a longitudinal one, we would just call attention to the bracket, Fig. 9, and suppose that A B is a beam firmly fixed at B in a wall in a slanting direction, and that the strut A C is removed. We shall have then the load W acting at A obliquely to A B, just as in the case of the strut in Figs. 5 and 6. This will undoubtedly cause the beam to bend downwards; and if W is resolved into forces P and Q perpendicular and parallel to A B, then P will represent the transverse strain at A, and Q will be a compressive strain down A B. The moment of strain about B will be P × A B. A similar effect is produced by the load W on the top of the shore (Fig. 8), the component force Q represented by the line A F acting as a transverse strain on the end of the beam A B, supposed to be fixed at B, while the component P acts longitudinally down the beam.—E. Wyndham Tarn.

Article I., where a load acts at the apex of two rafters; but a little consideration will show that the cases are quite different. We may also observe that a force may be resolved in *any directions we please*, and it is for us to choose which directions best suit the case. As to Fig. 7, the collar D E does not act as a strut, but as a tie, and is generally secured with straps and bolts passed round the rafter at D and E; by resolving the load at D we get the horizontal thrust B *d*, which it produces at B.

The application of the parallelogram of forces to the shore, Fig. 8, was intended merely as an example, and it was *assumed* that the *only* force acting on the head of the shore was the weight W. The horizontal pressure at A was purposely ignored, and the reader was referred to the Building News of September 14, 1877, for a full investigation of the "Mechanics of Shoring." We do not see that we can throw any further light on the subject; but would advise our correspondents to study the *principle* of the *composition and resolution* of forces rather more thoroughly than they appear to have done.—E. Wyndham Tarn.]

Correction.—At end of paragraph 19 for "*k l* that in H I and K L, and *l o* the strain in the middle part I K," read "*h l* that in H I and K L, and *h o* the strain in the middle part I K."

CHIPS.

Colonel Ducat, R.E., held an inquiry at Colwyn Bay on Friday touching an application made to the Local Government Board by the local board of health for sanctioning a loan of £1,400 for sewerage purposes.

A proposal has been made for the erection of a statue of the late Sir Morton Peto, the contractor, at Lowestoft. Sir Morton's railway enterprises may almost be said to have created Lowestoft.

Greenbank Congregational Chapel, Hinton-road, Lower Easton, Bristol, was opened on Sunday. Mr. Trew is the architect, and Mr. James, of Stapleton-road, Bristol, the builder. The chapel seats 200 persons.

An oak screen has been erected in St. Deny's Church, Southampton, in memory of two former vicars of the parish. It was designed by Mr. H. J. Weston, of that town, and is placed between the chancel and a south chapel.

The local board of Oldbury formally appointed on Friday Messrs. Wood and Kenrick as architects for the proposed public buildings, and instructed them to prepare plans, specifications, and quantities.

A course of three lectures is to be given at the Royal Institute, Albemarle-street, W., on successive Thursday afternoons in January and February, commencing on Jan. 23, by Mr. E. Roscoe Mullins on "Sculpture in Relation to the Age."

The ventilation of the new postal sorting office, Seven Sisters'-road, Tottenham, has been carried out on Kershaw's system, the patent inlet and air diffuser being adopted for the supply of fresh air, and the patent pneumatic ventilator for the removal of vitiated air.

A new bank is now being erected in the Market-place, Blackburn, for the Manchester and County Bank. Messrs. Mills and Murgatroyd are the architects, the builders Messrs. R. Neill and Sons, and the carving being executed by Messrs. Howarth Bros., Manchester.

On Monday Princess Beatrice opened a bazaar in aid of the funds for the restoration of the church of the Holy Trinity, Reading. The church was in a very dangerous state, and has recently been restored, at a cost of £1,900, by Messrs. Wheeler Bros., from the designs and under the superintendence of Mr. George W. Webb, architect, of Reading.

A new reredos was unveiled at the parish church, Tywardreath, Cornwall, on Friday. It is of polished alabaster, made from the design of Mr. Richard Coad, of London, the architect under whose direction the church was restored nine years ago. Mr. J. McKulloch, of Kennington, S.E., was the sculptor, and the cost was £260.

A new police-station has been erected at Victoria Park, E., and special attention has been paid to the ventilation, which is carried out on the Boyle system, the latest improved form of the self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

A new Liberal Club at Colne, Lancs, was opened by Sir U. Kay-Shuttleworth, M.P., on Saturday. It is faced with stone and is Renaissance in style, having a tower with projecting balcony beneath. The architect was Mr. C. Parsons, of Burnley, and Messrs. Hawley Brothers were the builders. The cost was £3,000.

Building Intelligence.

Liskeard.—The parish church will be re-opened to-day (Friday), after restoration and improvement commenced in May last. The church underwent restoration in 1878-9 from the designs of Mr. J. Sansom, architect, Liskeard; but the vestry and chancel were then reserved for future effort. The dilapidated vestry was first taken in hand, and gave place in 1888 to a new structure. This is of 15th-century style, harmonising with the church, the windows, doorways, and other dressings being of granite, the floor tiled, and the interior fittings of oak. The chancel, which has now undergone restoration, was very badly arranged, and there was no apparent distinction between it and the nave. The view of the east end was, moreover, obstructed by the pulpit, the high reading-desk, the clerk's desk, the churchwarden's pew, and the pew of the Liskeard Corporation. These obstructions have now been removed, the chancel rearranged, and a clear view afforded of the altar. The chancel floor has been raised one step above the nave, and the sacrarium two steps above the chancel, the last-named steps being of Ogwell marble. The floors have been paved with encaustic tiles. The oak pulpit, which bears date 1636, has been refixed on a moulded granite base lower than previously. New choir stalls are erected in teak. The reredos is of Beer stone; it has three main panels, divided by pinnacles and buttresses, the centre panel by a crocketed canopy. The sedilia are in teak, of similar character to the choir stalls. Altar and credence table have been made of cedar-wood in Jerusalem, from designs supplied by the architect. The chancel window has been filled with stained glass, the subject being "The Ascension." The east window of the north aisle has stained glass illustrating the text "Consider the lilies how they grow." Another stained-glass window is being executed for the north aisle. The corporation pews are placed in front of the nave seats, the bench ends being carved with the borough arms. In the north and south chancel aisles the seats have been rearranged so as to afford passages behind the stalls. The nave and chancel have been provided with new gas-fittings. The east wall of the chancel has been taken down and rebuilt, with a new granite five-light window. Mr. P. Blowey, of Plymouth, was the builder and contractor; the wood-carving and also the reredos were by Mr. Harry Hems, Exeter; Messrs. Minton and Co. supplied the encaustic tiles; and Messrs. Hart, Son, Peard, and Co., London, the altar railing.

London County Council.—At Tuesday's meeting of this authority the Parliamentary Committee reported that they had prepared a Bill to enable the Council to acquire and remove the south side of Holywell-street, and also sufficient land and buildings on the north side of St. Mary-le-Strand Church, and a portion of the inclosure at the west end of the said church, so as to form a practicable roadway with frontage thereto. The Bill, as ordered by the Council, contained a provision that no compensation should be paid for compulsory purchase. The Committee were advised, however, that the retention of this provision would be opposed by the authorities who were responsible for, and had the control of, private Bill legislation, and as the withdrawal of the words after the Bill was deposited would be attended with very considerable expense, they recommended that the words at the end of Clause 12, "nor shall any additional allowance be made in respect of compulsory purchase of any lands or premises," be struck out of the Bill. After a discussion and division, the recommendation was adopted. It was decided to introduce the London Subways and Overhead Wires Bill for regulating the construction and removal of overhead wires. The London County (General Powers) Bill, includes, it was reported, the following among other matters:—Alteration of Barking-road Bridge and approaches; the acquisition of Brockwell Park, Lambeth; repeal and consolidation of by-laws for parks and open spaces; provision of mortuaries; penalty for trespassing in main sewers; powers relating to buildings, water supply, and markets, and contracts as to payment in respect of country rate. The Bill was ordered to be presented.

Newcastle-on-Tyne.—The new Assembly Rooms at Barras Bridge were inaugurated recently. The elevations towards College-road are of Prudham stone, whilst those overlooking the college grounds are in pressed Normandy red bricks. The style is Renaissance. There are two main entrances, between which are windows, the centre with semicircular heads, with others on each side square, with moulded transoms and circular lights over, the spandrels between being richly carved. A cornice with panelled frieze and carved string over receives the first floor with colonnade of circular columns, terminating in carved capitals, flanked with projecting oriel windows, the whole being surmounted by a massive cornice, having balustrade broken with pedimented and gabled windows. The Assembly Rooms comprise two distinct suites of apartments, arranged to be let separately or together. One of the entrances gives access to the suite of rooms on the ground floor. The lower hall is 76ft. 6in. long by 37ft. wide, and is panelled in wood to the height of 8ft. above the floor, broken into bays with projecting pilasters, which are continued to the ceiling, and support the beams, which carry the upper room. The second entrance, after passing through a vestibule, opens on to a staircase, divided and arcaded with columns, spanned with elliptically-shaped arches, terminating on the landing over in a colonnade. On the first floor is the grand assembly room, 90ft. by 37ft. It is longitudinally divided into seven bays by double pilasters, standing on a dado, with moulded cornices and skirting, and carved panels continued to the ceiling. All the windows are filled with stained glass. At one end of the room is a projecting gallery. The floors, being intended chiefly for dancing, have been constructed on indiarubber cushions, the boards being of pitch-pine, in narrow widths. The supper room is furnished with lounges, and opens into the ball-room. Small rooms for cards and smoking are provided. The kitchen in the rear affords service to the various apartments by means of back stairs and lift. In the front of the building, billiard and smoke rooms suitable for a small club are arranged, with separate entrances. On the third floor are caretaker's apartments. The whole of the building is lighted with the electric light, the total candle-power being about 5,500. The contractors are Messrs. Middlemiss Brothers, for mason and bricklaying work, and Humphrey Atkinson for joinery. Mr. Shotton has acted as inspector, and the works have been carried out under the supervision of the architects, Messrs. Lamb and Armstrong, of Newcastle, and W. H. Knowles, of Gateshead.

Engineering Notes.

The Aviemore Railway.—The directors of the Highland Railway Company have resolved to proceed immediately with the construction of the line from Inverness to Aviemore. The works will be commenced at the Aviemore end, and tenders for the first section from Aviemore to Carr Bridge will at once be invited. The object of beginning at the southern end is to take advantage of the line to Carr Bridge to facilitate the conveyance of material for the construction of the large viaduct across the Findhorn valley and other important works in the locality. The construction of the line will shorten the distance between Inverness and Perth by more than an hour.

A commencement of the work of erecting the proposed new theatre and opera-house in Corporation-street, St. Helen's, has been made. Mr. W. Revill, the lessee of the old Theatre Royal, and Mr. Frank Matcham, architect, of London, accepted the contract of Mr. William Harrison, St. Helen's, for the erection of the building. The estimated cost is about £10,000, and accommodation will be found for about 2,000 persons.

In consideration of his long services as secretary of the Royal Society of Edinburgh, it has been resolved by the council of that body to present Professor Tait with his portrait. The commission has been given to Mr. George Reid, R.S.A., and the portrait is intended for the rooms of the Royal Society, to take its place by the side of those of many other eminent men which are hung there.

The ratepayers of Lambeth have, by a majority of 1,988, rejected the Libraries Commissioners' appeal to raise the libraries rate from a halfpenny to a penny. The conditional gift of about £15,000 for a central library at Brixton is, therefore, lost.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Leeds and Yorkshire Architectural Society.—"The Present State and Prospects of our Modern Architecture" was the title of the first lecture of the present session in connection with this Society, delivered on Monday evening by Mr. Edward J. Tarver, F.R.I.B.A., of London. Mr. Henry Perkin, president of the Society, occupied the chair. The lecturer observed that in the present day the use of distinct styles had become common to a great extent, but people were beginning to find out that rigid purity of style—Gothic inside and out of a house—sometimes produced rather a severe strain upon one's ideas of true comfort at home. Nowadays, an architect's client wanted his house built in some particular style or other, and so for the sake of peace and quiet the term "Queen Anne" had been murmured into his confiding ears. With regard to church architecture, the lecturer remarked that the most interesting of our old churches were those that were built in different styles. If architects admired the several styles of ancient architecture they should be consistent, and try to carry on the series by unfolding a style of their own. The attempt to improve on the work of the last man was what we now had in our civil and domestic architecture; not so much to preserve old forms as by adapting old forms to new ways and combining them. A large amount of original thought was being devoted to the fulfilment of clients' wishes, and it was admitted that this was being successfully done. Speaking of improvements possible in the construction of buildings, the lecturer emphasised the value of concrete, and considered that iron and concrete in combination had a great future before them. At the close, on the motion of Mr. Corson, seconded by Mr. Thorp, Mr. Tarver was cordially thanked.

Sheffield Society of Architects and Surveyors.—The monthly meeting of the above society was held at the School of Art on Tuesday evening. Mr. F. Fowler, the president, occupied the chair. A ballot took place, and Mr. H. Teather was unanimously elected a student of the society. Mr. J. B. Simpson was proposed by Mr. C. Hadfield, and seconded by Mr. A. F. Watson, for the Associateship. Mr. H. Longden read a paper on "Old English Ironwork."

Society of Engineers.—The thirty-fifth annual general meeting of the Society of Engineers was held on December 9th, at the rooms of the Society, 17, Victoria-street, Westminster, S.W. The chair was occupied by Mr. Jonathan R. Baillie, president. The following gentlemen were duly elected, by ballot, as the council and officers for the ensuing year, viz.:—As president, Mr. Henry Adams; as vice-presidents, Mr. William Newby Colam, Mr. Joseph William Wilson, jun., and Mr. William Andrew Valon; as other members of council, Messrs. Chris. Anderson, R. W. Peregrine Birch, James Henry Cunningham, Henry Faija, George A. Goodwin, Thomas Bell Lightfoot, James Wallace Peggs, and William Schönheyder; as honorary secretary and treasurer, Alfred Williams; as honorary auditor, Alfred Lass (Messrs. A. Lass and Co.). The proceedings were terminated by a general vote of thanks to the council and officers for 1889, which was duly acknowledged by the chairman.—The annual dinner was held on Wednesday evening at the Holborn Restaurant. The retiring president, Mr. J. R. Baillie, who occupied the chair, proposed the toast of the evening, "Success to the Society of Engineers," which was acknowledged by Mr. Alfred Williams. The health of the chairman, proposed by Mr. A. T. Walmisley, that of the president-elect Mr. Adams, and other toasts followed.

The foundation stone of a new mission church was laid at Polruan last week, the edifice being designed to replace the old chapel of St. Saviour's, which existed in the twelfth century. Polruan contains 1,100 people, and is a mile and a half from the parish church. The estimated cost of the new building is over £1,200. The plans for the church have been prepared by Mr. W. Swift (Henderson and Sons), architect, and the contractor is Mr. Penter. The building will be Early English in style, and will consist of nave, south aisle, and chancel, the dimensions being 80ft. by 30ft. A quarry at the rear of the site will supply the requisite stone.

At the meeting of the Edinburgh Architectural Association, held last (Thursday) evening, a paper, entitled "Bye-paths in Architecture," was read by Mr. G. S. Aitken, F.S.A. Scot.

COMPETITIONS.

Douglas.—In the recent competition open to architects for designs to provide increased accommodation for the passenger traffic at Douglas, Isle of Man, the plans of Mr. Henry A. Cheers, of Twickenham, have proved successful, and he has been commissioned to obtain tenders from builders forthwith. The accommodation to be provided embraces luggage and ticket offices for the steam packet companies, ladies and gentlemen's waiting-rooms with extensive cloak-rooms, lavatories, &c., police and cabmen's shelter, a large public arcade 60ft. by 50ft., large refreshment rooms, and twelve lock-up shops. The whole will be on the ground floor level, and covered with a flat roof which will form a spacious promenade overlooking the landing pier.

Harrogate, Baths and Colonnade on the Montpellier Estate.—The instructions to architects engaged in the preliminary competition for these works have just been published. The Corporation of Harrogate having recently acquired the Montpellier Baths and Estate, and being desirous of erecting thereon a suite of baths, which shall comprise the most modern bathing appliances, invite sketch designs for the proposed buildings, illustrated by plans of each floor, two sections and two elvations—one towards Crescent-road and the other to Montpellier-road. One set of plans only is to be submitted by each competitor, no alternative plans being allowed, and any infringement of this regulation will be deemed a disqualification. Each drawing must be made to a scale of 16ft. to an inch, and mounted on a stretcher 3ft. long by 2ft. 8in. wide. The walls on plans and sections are to be black, and the elevations in line only, without colour or shading. Each set of drawings to be sent in anonymously, but accompanied by a sealed envelope containing the author's name and address. When each case is unpacked, it, and its contents, will be marked by the corporation authorities for identification, but no distinguishing mark, motto, or device, is to be put on the drawings, description, envelope, or case by the competing architects. Provision must be made for the future extension of the bathing establishment; but this need only be shown in outline upon the plans. Each set of drawings must be accompanied by a short statement of the materials suggested, and giving the cubical contents of the buildings, calculated from the footings to half the vertical height of the roofs, and including all towers, chimney stacks, or special features of any kind. The style of architecture will be left entirely to the discretion of competitors, and no maximum cost can be assigned for the complete scheme, as the object of the corporation is to secure a bathing establishment of the first rank, without, however, going to a lavish expenditure. The corporation will select, with the advice of their assessor, from the sketch-designs sent in, those which they consider most suitable, not exceeding four in number, and will request their authors to supply such further plans, sections, elevations, details, and perspective views, as may then be required for their more complete illustration. A sum of £375 will be divided amongst the architects taking part in this final competition as follows—viz., the author of the design placed first in order of merit will receive £150, the one placed second £100, the third £75, and the fourth £50; but the premium of the design executed will merge in the commission of 5 per cent. for carrying out the work. The corporation promise to engage a professional gentleman of eminence to act as assessor in both these competitions; but they reserve to themselves the right of ultimately deciding which set of designs shall be adopted. All sketch plans to be sent in (carriage paid), addressed to the borough surveyor, Harrogate, on or before the 1st day of March, 1890. The day for sending in designs in the second competition will be the 1st of May, 1890.

Southport.—The designs of Mr. Frederick W. Dixon, architect, Oldham, have been selected in a recent limited competition for proposed new Sunday schools at Southport, for the London-street Primitive Methodists of that town. The buildings, which will be of a Renaissance character, are to be faced with Ruabon bricks and finished with stone dressings. The cost is estimated to be about £2,500.

The police commissioners of Castle Douglas, N.B., have adopted a scheme by Mr. Barr, C.E., for the drainage of the burgh.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

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Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Received.—G. R. and Co.—Val. Vox.—M. L. D.—S. V. —Melbourne.—W. H. G.

Correspondence.

THE EDUCATION OF ARCHITECTS.

To the Editor of the Building News.

Sir,—Being from home, I have only just read your leading article in the Building News of Nov. 22nd on the above subject, in which, amongst much that is admirable, I find the following, referring to the case of an architectural practitioner of 50 presenting himself for examination:

"If he could do so conveniently, and at little cost to himself, he would willingly submit. We say that such is the case with very many architects."

For the honour of the profession, I hope you are wrong—and very far wrong. I should have no high opinion of the practitioner of 50 who has so light a grip of business and of his profession as to feel it incumbent upon him to have his qualifications franked by any examining body. Such a one would not give high promise of gracing the world with monuments of his ability, whatever his examiners might venture to say.

Let us not fool round this question, nor mix up things which differ. The architect of 50, who has been in practice, let us say, for twenty years or more, will have settled his professional life for better or worse, and will have placed his craft beyond the influence of any examinational eddies. Twenty years of practice ought to have given him such an experience as no training for examination could supply to the same degree. It would be well, however, that all young men entering the profession should be led to look forward to the passing of an examination sufficient to test, with more or less thoroughness, their qualifications for undertaking the duties and responsibilities of an architect. But what man in his senses would think of employing a young and newly-fledged examinee purely on the strength of his having passed some examination? Such a one has, in

fact, as yet to win his spurs; the passing of the examination—if that be made compulsory—merely giving him the right to enter the lists. If we have to undergo a serious operation, we are careful to select a surgeon—not altogether from the examinations he may have passed years ago, but one who has given evidence in his practice that he may safely be trusted to carry out the surgical work which we have to place in his hands. Examinations, however, may give such a direction to the mind as to colour the whole after-life; and as the examination is, so will be the education which is to lead up to it. Here is where the Institute, and all men of influence amongst us who have given thought to the subject, may do much for the future of the profession. Whilst not unmindful of what the Institute has done, and is still doing, by its voluntary examinations—and I think we may, perhaps, rate such examinations too lightly—I hold, with you, that voluntaryism might, with advantage, be superseded by the compulsory test. But what should be the dominant features of this test? Should they be scientific or practical, or should they be æsthetic? Our leaning to the æsthetic has thus far, it seems to me, not favourably impressed the public with our fitness for spending its money. Why, then, not let us give a trial to the scientific and practical? Who will say that we are looked upon as having the vigorous personality of the engineer? Has our weakness for producing pretty and taking "sketches" not rather led us to be set down, at best, as "originators of unusual types," like that adjunct of feminine life, the ladies' tailor? If we could rigorously subordinate our artistic instincts for a couple of generations, and give our chief thought to scientific, practical, and business matters, we should, I think, do more to correct past errors and rehabilitate our profession in the eyes of the public than by any other process. We will always retain, I should suppose, a sufficient feeling for old ways to give our construction an outer-garb of presentable form. The more we can train a man, however, to meet the average client's one standard of excellence—to secure the best value for the money expended—the more satisfactorily and profitably shall we enable him to follow the practice of an architect. It is surely not too much to expect that we may some day be looked upon as serious business men, rather than be regarded as mere architectural *modistes*.—I am, &c., J. J. LISH.

R.I.B.A. SUBSCRIPTIONS.

SIR,—The number of members has so greatly increased that it appears desirable that the present excessive subscriptions of Fellows should be reduced to *three* guineas per annum.

If students make use of the library of the R.I.B.A. and take up the time of the officers, &c., surely they should pay a subscription for the privilege, and it is unfair to old members that they should be called upon to pay the costs of, or provide premises for, the examinations.

The "Transactions" this year show a great falling-off (both in quality and quantity), quite one-third of the matter has been printed before, and should have reappeared in separate form, *if at all*.

We are paying the secretary and officers well, and I am of opinion that we are letting them do too much for the young and too little for the old members.—I am, &c., FAIRPLAY.

December 11.

SANITARY TOWERS TO DWELLING-HOUSES.

SIR,—Most people who, like myself, have spent the greater part of the last ten years abroad will be struck with the immense improvements which have taken place in our English domestic architecture, and the designs which appear in the BUILDING NEWS week after week of churches, mansions, villas, cottages, &c., are—many of them—perfect gems of beauty, and most suggestive of comfort. Widely different are they to what we see in Italy, Germany, and France.

Entering Paris from the south, or indeed from any side, one is painfully struck with the hideous things which represent the suburban villa in France; but of late years our own street and domestic architecture has undergone a great change for the better, notwithstanding what is said, and said with justice, about "jerry building." What is not less important, at any rate in my eyes, is the way in which efficiency in sanitary arrangements is combined with elegance. The one great fault, however, which is to be found with most modern buildings is the placing of the water-closets, &c., *inside* the house.

Efficient trapping of the closets, sink-pipes, &c., inside the house, and, again, of the whole system of house-drains, with complete and thorough ventilation of both drains and soil-pipes, no doubt makes such arrangements safe, so long as no defect occurs from wear and tear, or accidents.

These needful accessories of a dwelling are best placed outside the outer walls, and in hospitals this is secured by locating them in corner turrets, which admit of thorough ventilation between them and the ward; but in houses built for seaside or suburban residences they occupy a hideous square mass of plain masonry stuck on to the back wall of the house, and are painfully "*en evidence*" in unabashed ugliness.

I would suggest to architects that these offices should be relegated to a square tower, designed like the campanile of an Italian church, which could be made a very marked ornament to a house, and in the case of houses in rows, one such might serve the needs of two houses by building it of double size.

In country mansions such a tower could have its upper part utilised as a clock-tower or open balcony, and terminate in a weathercock or flagstaff. It might be made to contain the w.c.'s, sink-stones, bathrooms—*all entirely external* to the house, and not only efficiently ventilated and trapped, but cut off from the house itself by means of cross ventilation. An ingenious architect would easily make such a tower an ornament to the house, into which sewer gas could find no entrance, and the whole interior space be available for the purposes of a dwelling.

The arrangement I suggest would secure absolute privacy and sanitary efficiency, and instead of the house being disfigured, its beauty would be rather enhanced by these "towers of silence" dedicated to the goddess Hygeia.—I am, &c.,

E. DRUMMOND, M.D., D.P.H.Camb.

December 6.

CHIPS.

The Common Room of the Architectural Association, at 9, Conduit-street, W., will be opened on Tuesday next, when a discussion will take place on "The Position of Architectural Assistants."

The Dean and Chapter of Canterbury have engaged Mr. Ewan Christian to make a thorough examination of the Cathedral in the ensuing spring.

The Lord Mayor visited in state the Central Markets in Farringdon-road on Wednesday, for the purpose of opening the new section for the sale of poultry and provisions. The market was originally built for the sale of fruit and vegetables; but before it was completed the Corporation decided to open it as a fish market, and it was opened for that purpose in May, 1883. As a fish market it proved a complete failure, and the space has been utilised for the sale of poultry and provisions. The market, which occupies an area of nearly 44,000ft., cost about £160,000, and, together with the land and the approaches, the total cost was £450,000. The alterations, which have been carried out by Messrs. Perry and Co., Tredegar Works, Bow, under the direction of Mr. Alexander Peebles, the City architect, have cost an additional £12,000. Four new blocks of shops, with iron girders for hanging accommodation, have been built in the centre of the market.

At the last meeting of the local board of South-end-on-Sea the surveyor to the board, Mr. P. Dodd, was voted an increase of £50 a year to his salary. At the same meeting a report was received from Messrs. Brunlees and McKerrow, the engineers for the reconstruction of the pier, stating that the timber work is far advanced, but the contract for ironwork has not yet been let, owing to the expansion in the iron trade. The other contracts on the pier are being carried out by Messrs. Arrol, of Glasgow, and Mr. J. T. Chappell, of Pimlico.

A lecture was given at the Birmingham and Midland Institute, Birmingham, on Monday evening by Mr. J. A. Gotch, F.R.I.B.A., upon "The Homes of Queen Elizabeth's Courtiers." There was a large attendance of members, and the lecture was illustrated by lantern views.

The Council of the Home Industries Association have formally accepted the invitation of the Birmingham Kyrle Society to hold their next exhibition in Birmingham. The exhibition will probably take place in the beginning of June at the Masonic Hall in that city.

Intercommunication.

QUESTIONS.

[10168.]—**Party-Wall.**—I propose building a pair of semi-detached villas, and the party-wall between the houses I have shown to be a 12in. hollow wall, two 4½in. walls and 3in. cavity, the whole tied together with galv. iron ties. I should be glad to have the experience of any of your readers as to whether this is the best means of building a party wall to prevent sound penetrating; and also the most effective pugging for floors. Villas consist of ground, first, and attic floors.—ARCHITECT.

[10169.]—**Pitot's Tube.**—Will some kind reader give a sketch and the formula for working "Pitot's tube," an instrument for ascertaining the velocity of water in rivers, streams, &c.? It consists of a glass tube, which is held in the water in such a manner, that its lower end is horizontal, and opposed to the direction of the flow. In consequence of the momentum of the moving fluid, the level rises within the tube to a height proportional to the velocity of the stream.—ELEVE.

[10170.]—**Articles.**—Will one of your readers kindly advise me as to the following?—I was articled to an architect and surveyor who, unfortunately, died during my term, and I finished my time with his successor (who received no portion of the premium). The executors cannot find my articles amongst the deceased's papers. What course ought I to adopt under the circumstances?—ANXIOUS.

[10171.]—**Renewing Photographs.**—I have in my possession some photographs of foreign buildings, &c. These, however, either for want of proper fixing at the time they were taken, or through age, are faded and very indistinct. Will some kind reader please inform me how I should proceed to render them clearer and more pronounced?—NIL DESPERANDUM.

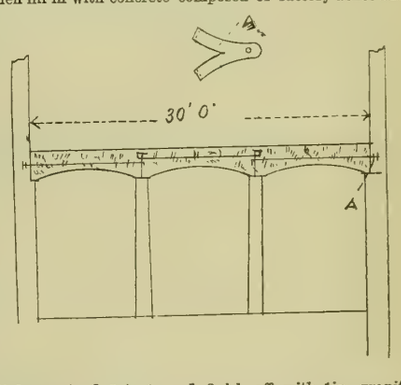
[10172.]—**Lyndhurst-road Church, Hampstead.**—Will some correspondent kindly say if the plan and any drawings of Lyndhurst-road Congregational Church, Hampstead, built about six years ago, have ever been published in any of the architectural journals. Mr. Alfred Waterhouse, R.A., was the architect. It is so cleverly planned, that I wish to get any particulars that may be published.—F. P. P.

[10173.]—**Charges.**—What would be a fair charge to make for the preparation of drawings and specification, and superintending the erection of a row of five or six small houses, to cost about £200 each; and also what would be a fair charge for getting out quantities for same? Could travelling expenses be charged extra?—W. A.

[10174.]—**Spring Ball-room Floor.**—Will some experienced person kindly give me full instructions for laying a spring ball-room floor? By this name I mean a floor which has a springing motion.—FLOORS.

REPLIES.

[10160.]—**Fireproof Floor.**—In answer to "J. W. S.," fix two rows of 12in. by 6in. rolled iron joists—*i.e.*, 10ft. centres on columns, 15ft. centres, and 1¼in. tie-rods bolted to holdfasts built in wall in cement, and screwed up with nut and thread at beam ends of rods, say 7ft. 6in. centres. Then fill in with concrete composed of factory ashes and



clinker, mixed 5 to 1, and finish off with 1in. granite chippings and cement, mixed 2 to 1. Let concrete be 6in. thick at crown, and cover iron 2in.; also screen dirt out of the ashes, and see that they contain no acids, which would be injurious to the cement. I inclose sketch, showing section.—J. ASHLEY.

[10163.]—**Corrosion in Iron Pipes.**—If "Provincial Builder" will use enamelled tubes for water services he will never be troubled with corrosion again. I have used them for years past, having laid many miles of them on this estate, and have never found any obstruction whatever. I am just completing some new waterworks, where there are about two miles of services lapped into the cast-iron mains, consisting entirely of enamelled tubes of ¾in. ¾in. and 1in. diameter. Although the cost of enamelling is a considerable item, the pipes are really cheaper than ordinary plain pipes; the friction being much less in the smooth enamelled pipe, a smaller one can be used. I have found in practice that 1¼in. enamelled pipes will deliver more water than 1½in. plain pipes through a length of, say, 1,000ft., and the lifetime of the former will be more than double the latter. The pipes should be bedded in clay. If "Provincial Builder" will put himself in communication with me, I shall be pleased to reply to any queries he may desire to put to me.—W. BUCKENHAM, Longleat.

A grammar-school for girls is about to be built at Rushey-green, Catford, S.E. Mr. Albert L. Gay, of Lewisham, is the architect, and Mr. S. J. Jerrard the contractor. The cost will be about £8,500.

LEGAL INTELLIGENCE.

IN RE JAMES.—An application has been made to Mr. Registrar Hazlitt for the approval of composition resolutions agreed to by a statutory majority of the creditors of Thomas James. The debtor had traded as a builder and contractor at Stoke Newington and Stamford-hill, and the receiving order was made on September 18 last. His liabilities were returned in the statement of affairs at £88,653, of which £85,369 were secured, and the resolutions provided for the immediate payment of a composition of 2s. 6d. in the pound to the unsecured creditors, and of all preferential debts and costs. The debtor attributed his failure to losses occasioned by taking over and completing certain houses for another builder, and by depreciation in the value of house property at Stamford-hill, and to other causes. The Official Receiver reported that his proposal was reasonable and calculated to benefit the creditors. After some opposition, Mr. Registrar Hazlitt made an order approving the resolutions.

IN RE W. C., L. C., AND J. F. BISSETT.—At the Sheffield Bankruptcy Court on Wednesday a bankruptcy petition was presented against William Crellin Bissett, of Ashdell Villa, Sheffield, Lawrence Colgrave Bissett, of Southbourne-road, Sheffield, and James Francis Bissett, of Edgbaston, Birmingham. The three are brothers, and since their father's death in February, 1888, have carried on business on a large scale as builders and contractors at Sheffield and Birmingham under the style of William Bissett and Sons. The acts of bankruptcy alleged are that William Crellin Bissett and Lawrence Colgrave Bissett did on the 28th of November, with intent to defeat and delay their creditors, depart from their dwelling-houses, or otherwise absent themselves; and the act of bankruptcy alleged against James Francis Bissett is that on the 4th of December he filed a declaration admitting his inability to pay his debts. It is stated that the liabilities are heavy. Messrs. Bissett have erected many large buildings in Sheffield, Birmingham, London, and other places.

WATER SUPPLY AND SANITARY MATTERS.

CLOWNE AND BARLBOROUGH SEWAGE.—A special meeting of the Worksop Rural Sanitary Authority was held on Wednesday at Worksop to consider the plans prepared by Mr. W. H. Radford, C.E., Nottingham, for the sewerage and sewage disposal of Clowne and Barlborough. Mr. Radford was present, and explained that he proposed to lay down two systems of pipe-sewers, and deliver the sewage at two separate outfalls. There would be one outfall for each parish, and about half an acre of land would be required for the purification works at each outfall. The sewage would be purified in tanks by means of chemical precipitation, combined with filtration through special filter-beds. The chemical system adopted would be that known as the "Acton process," as applied at Hendon; and no machinery or pumping would be required, as the chemicals would be suspended in a wire basket and dissolved by the flow of the sewage. Several ratepayers attended from Clowne to represent that some of the proposed sewers for draining Harlesthorpe, High Peak, and Laburnam Terrace were not at present required, as there was only a scattered population of about 700. The further consideration of the schemes was adjourned to the next meeting.

PONTEFRACT NEW WATERWORKS. — For some weeks past the sinking operations at Roall, near Whitley Bridge, in connection with the new water-supply for Pontefract and district, have been almost at a standstill in consequence of the failure of the pumping apparatus, which was inadequate to cope with the great amount of water found as the sinking proceeded. Powerful machinery has now arrived at Roall from Manchester, and Berry's patent pumps are being fixed, and the work of sinking was begun again on Friday. The depth of the well already reached is about 70ft., and water in abundance met with; but it is intended to proceed to a depth of at least 120ft. The contractors are Messrs. Vickers and Son, of Nottingham, and the engineer Mr. George Hodgson, of Loughborough. The Local Government Board in London have only granted the loan of some £2,300, conditionally that the well-sinking operations should be completed first and found to be satisfactory before the remainder of the works are started. The quality and quantity of the water promise well.

At a vestry meeting held at Prittlewell, Essex, last week, a restoration committee was appointed to carry out the repair of the noble tower of the parish church, the mother church of Southend. Sir Arthur W. Blomfield, A.R.A., who carried out the restoration of the general fabric, has been consulted as architect.

The town council of Bury, Lancs, have accepted the resignation of the office of assistant surveyor tendered by Mr. John Cook, with thanks for his services, and have advertised for a successor at a salary of £130 a year.

Our Office Table.

IT is stated on good authority that Brockwell Park is all but acquired. The residents of South London have every reason to be congratulated on their good fortune in obtaining so well-wooded and pleasingly undulated a park, a natural one, that does not require a costly expenditure in footpath and artificial lake-making to improve it. But the inhabitants who are likely to obtain so great a boon, ought to be careful that the benefits derivable are not diminished by the cupidity of the owners of the estate. A belt of houses closely built round the grounds will considerably diminish its park-like qualities, and the park seen on a Bank Holiday by delighted multitudes, with its horizon of woodland and hills, may be a very different picture to that which will be presented in a few years time, if the speculative builder is allowed to obtain an easy footing on its borders.

LUDGATE-HILL has no longer the narrow and contracted appearance it once had, but it has lost some of its picturesque irregularity. We have a row of stately-built premises, all set back to a line, with no very salient features to break the elevation. On the north side the alteration would have been a distinct loss, if, for example, Wren's picturesque church and steeple of St. Martin had been sacrificed. The total expenditure, we hear, on the several lots acquired by the Commissioners of Sewers is £324,326. While widening operations are being carried out, would it not reflect on the humanity of the authorities to institute some new kind of paving, which would give a better foothold for horses during this season? The roadways of steep gradients are a torture to horses whenever they get into a greasy condition. Surely the remedy is easy and cheap!

AN interesting experiment in profit-sharing with their employés is about to be made by Messrs. Peto Brothers, the well-known contractors. The firm have determined to give the men employed on the Asylum at Canehill a fourth of the net profits of the job. The distribution will be according to the wages earned as shown in the time-sheets, the wages being on the recognised existing scale. Among the stipulations made by Messrs. Peto is one that no workman shall participate who shall have earned less than £5 on the contract. Men are to be also excluded who, by wasting their time, misconducting themselves, or neglecting their duties, shall do anything tending to lessen the profits; and those who do anything tending to damage the reputation of the firm for good and honest work will forfeit their share of the bonus. The same penalty will attach to those who, during the performance of the contract, shall join any strike for shorter hours or for higher wages than those existing at the time the contract was made. The shares of men so forfeiting their claims are to be added to the shares of the others.

PROFESSOR MARIAN, of Perugia, has just completed and set up at South Kensington Museum a model of a portion of the famous Villa Madama, erected at Monte Mariotto, near Rome, for Cardinal Giulio de Medici, afterwards Clement VII. This was carried out from the designs of Raphael, the interior being decorated, about the year 1523, with frescoes, set in elaborate stucco-work, by two of Sanzio's most noted pupils, Giulio Romano and Giovanni da Udine. The model, which has cost the Department £350, shows, on the scale of one-tenth, a portion of the interior of the great hall, with elaborate ceiling and wall decorations of the semi-Classical type, borrowed by Raphael from the Baths of Titus, and assimilated by him in the much-copied Loggie.

A CURIOUS example of the way in which some men will seize every opportunity to tout for professional business came before the London School Board at their meeting yesterday (Thursday). A letter was read from a person, whose name was given in full, offering his services in the event of the Board deciding to call in the assistance of professional experts to advise in connection with the numerous schools which have been erected; and stating that he has been professionally connected with the building trade for over 30 years, that he has had an extensive and varied experience, that he is personally unknown to every member of the Board, and that he has never done anything for any of the builders whom the Board have employed. The last two assertions seem rather inconsistent with the "extensive and varied experience" claimed. It is gratifying to add that the name of this modest but energetic gentleman does not appear in the list of membership of any recognised body of architects.

THE introduction of hot-water coils to the corridors of the London Board Schools is the subject of various tenders. Many of the schools are most inadequately warmed, and this requirement seems to have been little thought of at the time of their construction. Large windows and an almost unlimited supply of cold air make any economical system of warming a difficult matter, and we would suggest that the Works Committee should inquire into the question by taking observations of the temperature of schoolrooms, and report on a more efficient scheme that would be less costly in the future. The large glazed surfaces could be reduced in size with desirable results. Hot-water coils are costly and cumbersome. Why should not the hot-air plan be adopted?

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. "The Architecture of Provence," by David McGibbon. 8 p.m.

TUESDAY.—Manchester Architectural Association. "A Visit to Doulton's Pottery Works," by F. B. Smith.

Glasgow Architectural Association. "Scottish Collegiate Churches of the 15th and 16th Centuries," by Hippolyte J. Blanc, of Edinburgh.

Architectural Association. Opening of Common Room, at 9, Conduit-street, W. Discussion. "The Position of Architectural Assistants."

Institution of Civil Engineers. Discussion on Professor Osborne Reynolds' paper on "Triple Expansion Engines." 8 p.m.

WEDNESDAY.—Society of Arts. "London Sewage," by Sir Robert Rawlinson, K.C.B. 8 p.m.

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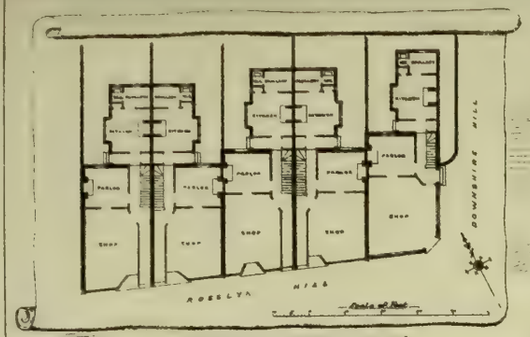


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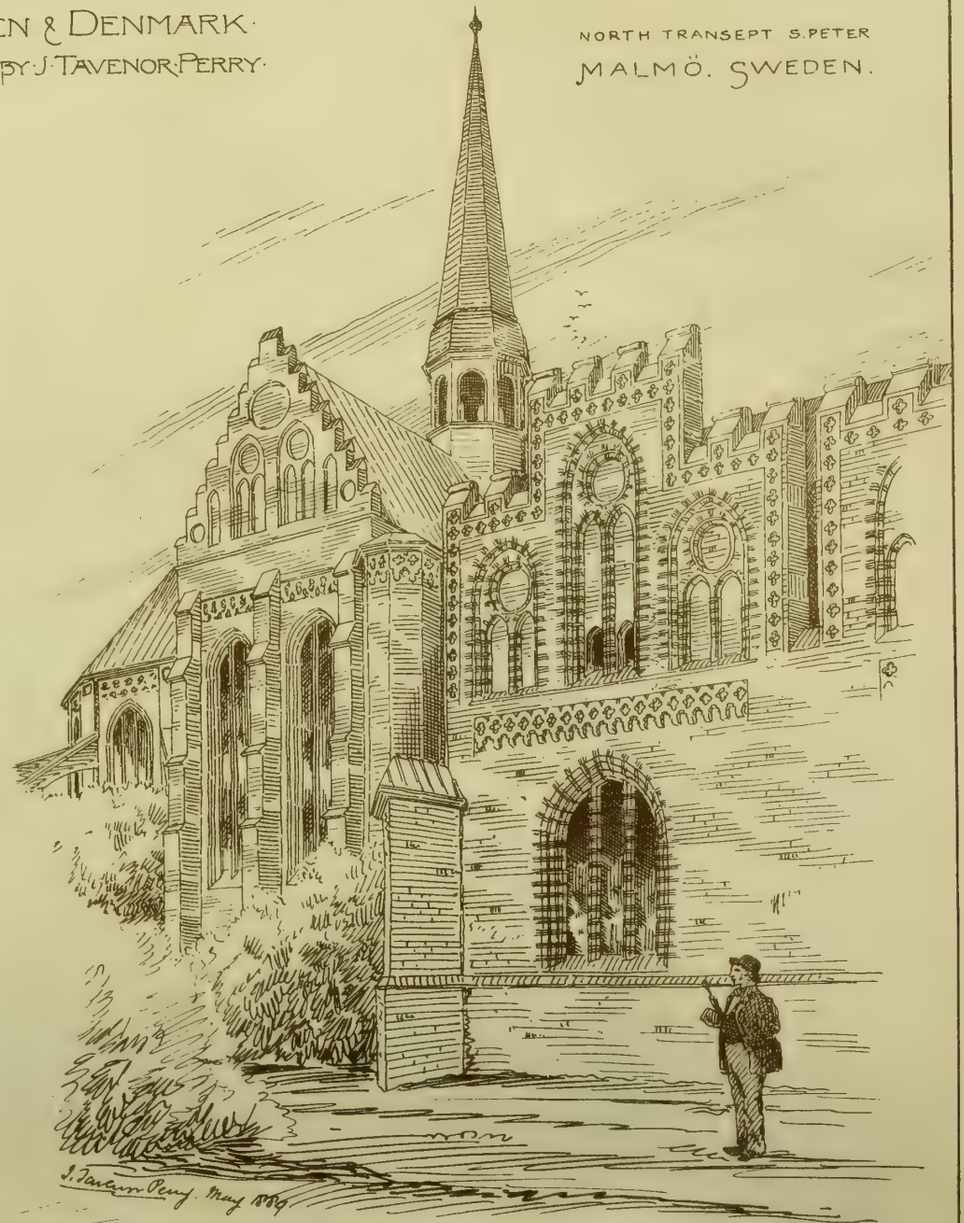
SKETCHES · FROM · SWEDEN & DENMARK ·

BY J. TAVENOR PERRY.



CHAPELS SOUTH OF NAVE S PETER
MALMÖ. SWEDEN

NORTH TRANSEPT S.PETER
MALMÖ. SWEDEN.



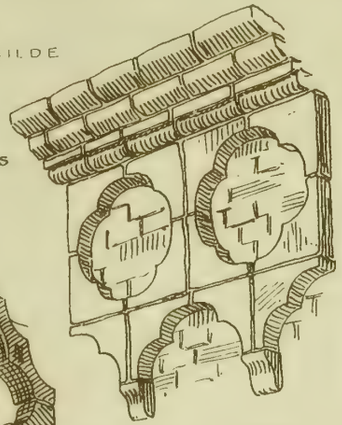
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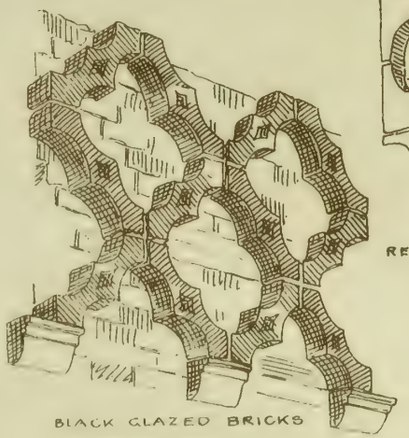
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BLACK GLAZED BRICKS
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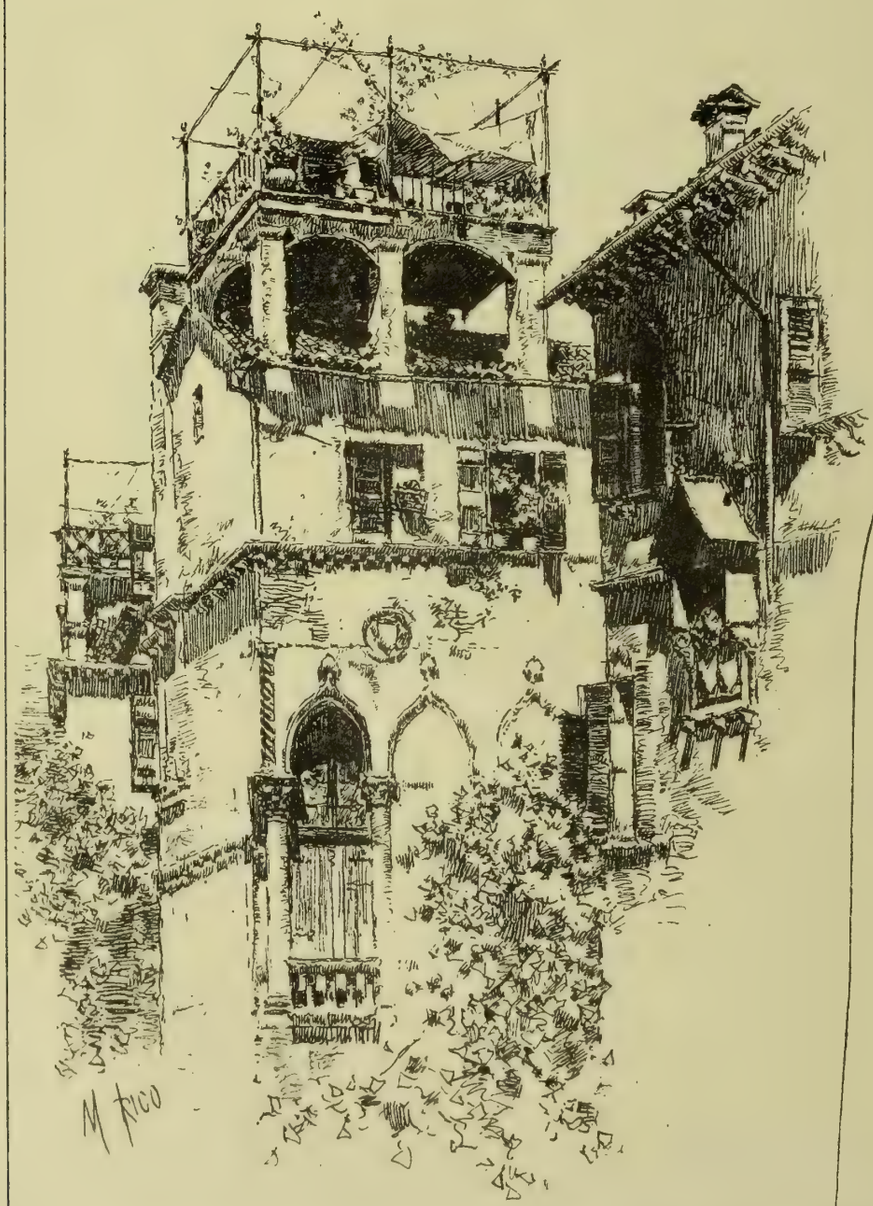


GAMLA UPSALA
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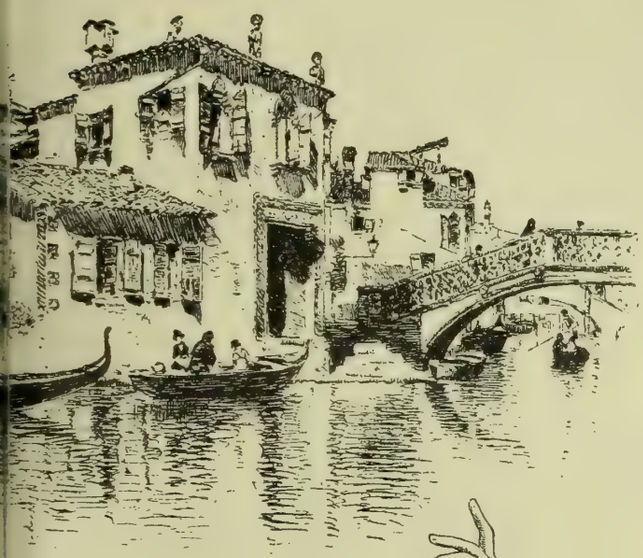
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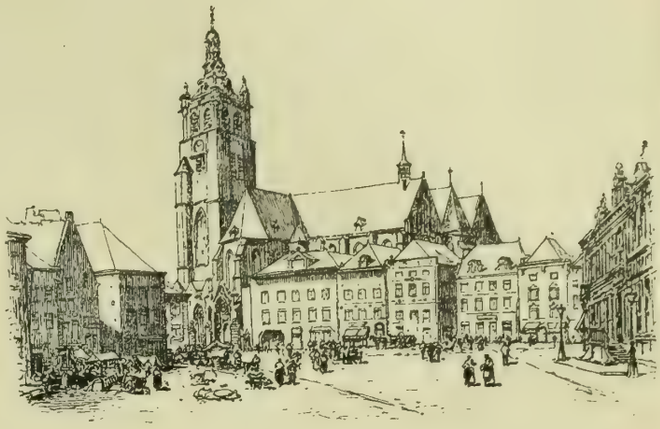





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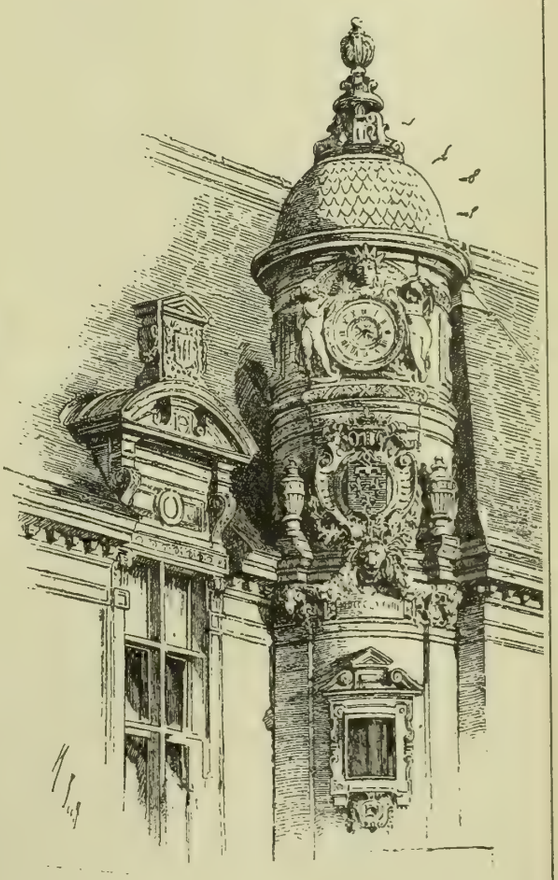
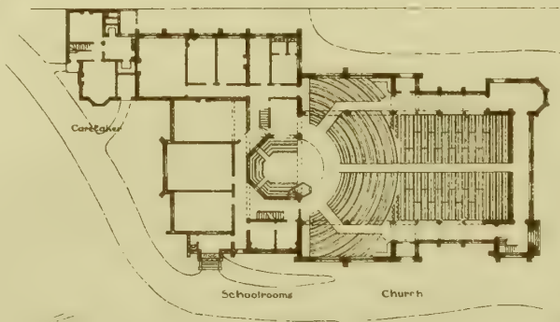


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Richmond Hill Congregational Church



Bournemouth

Selected Design

Messrs Lawson and Donkin Archts

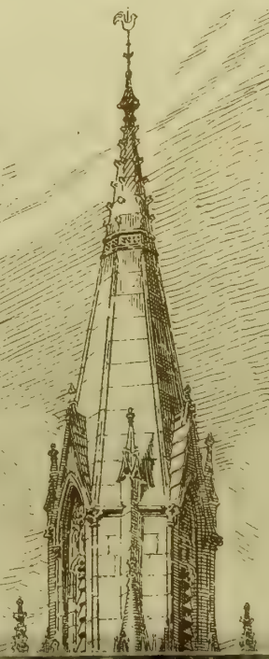




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J. Dankin Del.

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1824.
FRIDAY, DECEMBER 20, 1889.

SENSATIONAL ARCHITECTURE.

THE desire for sensation in art and architecture is almost as obtrusive as it is in literature, in dramatic production for the stage, and in other pursuits. We have painters who are never content to paint Nature as they see her, but to give us microscopic details, daubs, streaks of brilliant colour, obscure impressions seen through grey mists. Almost impossible effects are placed before us, and we are told that if we cannot appreciate them we are blind to the teachings of Nature, and do not understand the "values" of light and shade, or of tone. The pre-Raphaelites and the French impressionists were men who boldly waged war against conventions in art, which threatened to sink into a lifeless *régime;* they rescued painting from a set of picture-makers, though they each took very opposite views of the purpose of art. They therefore were honest combatants in their extreme opinions; but it is not so with the school of sensation-mongers. This craze for novelty and singularity is found in many of the manufactures of useful and decorative objects, in metalwork, textile fabrics, glass, and faïence. Something boldly defiant of the canons of propriety in design and colour, a departure from the rules of composition, startling colour, bizarre effects are to be met with. But the craving after sensation has found a great many disciples amongst architects. We have had "acrobatic" Gothic and "Queen Anne" hybrids, and we are threatened with "crazes" almost as remarkable in the design of our large business establishments, a kind of architectural "rant" for which American architects have acquired some notoriety. Throwing aside traditional rules at once opened the door for all sorts of irregularities, oddities, and quaintnesses of Dutch and Flemish extraction, many delightful to those who look upon fashion in architecture and domestic decoration as they do in dress, and who regard it as heresy to have such a thing as a console marble mantelpiece or a fender and coal-scuttle that are not *en regle* with the particular art cult of the day. But Flemish taste is only made a passing commercial fashion by these people; for we candidly admit that such a person who buys a Flemish or Jacobean suite of furniture or a cabinet does so because it is the craze, and not because he has any conviction of the merit of the style. It is good for trade. So with a new architectural front. The enterprising commercial firm goes in for fashionable or "sensational architecture" because it pays them to do so; it is a good advertisement to have a front that is strikingly different to the houses adjoining, or in the "latest" style, and the architect who can give such a front is regarded as the man to employ.

Looking at some of the recent conspicuous examples of buildings in our public streets we cannot but take notice of this spirit. Truth is sacrificed to whim, canons of architecture are subverted; the "Orders" are painfully caricatured, and details such as mouldings are often seen that have nothing appropriate about them, often out of their proper position, and singularly travestied in form. It is considered by a class of architects who follow this license to do things as they never were intended to be done, and to produce a sort of farrago, that their work looks "fresh" and clever. "Fresh and clever" it may be to those who regard architecture as a meaningless combination of forms, and who think a building can be dressed up to look like anything. An unappreciative public and an uncritical *clientèle* call anything clever till they are taught to know that there is a violation of some law; the architect who ought to educate the public eye and mind in these matters wins a cheap but doubtful reputation by pandering to a taste which he knows is bad, and to a fitful temper in art which cannot survive.

To classify these anomalies, one of the most noticeable is the sacrifice of breadth by the multiplicity of details. These have not often the merit of being all in one style; the introduction of a variety of ideas taken from buildings of different ages and of various materials are frequently found. In one story we have bits of Flemish brickwork, in another Italian Renaissance stonework of the 15th century, and in a third "Queen Anne" in stumpy pilasters and balusters. This sort of eclecticism is always without a keynote or *raison d'être;* the scrap-book or the "paste and scissors" appear to have been freely used in the composition, partly to save invention, and partly to arrest attention by fulsome and crowded detail. The exuberant florid style affected by some Gothicists is one of the forms most liable to this weakness. With all its merits the design for the Great Indian Peninsular Railway Terminus at Bombay is chargeable with this redundancy. Instances of it may be seen in the Strand and Eastcheap, and in many City thoroughfares, where the open fenestral and pilaster craze has been worked to death. The architects have failed to see that the blank wall and the panelled attic and piers so well treated by Parisians have their value in giving point and interest to the more enriched portions.

The next weakness is want of proportion. The sensational architect will use stumpy pilasters and prodigious capitals because they look quaint; the inverted shaft is seen in buildings as well as in furniture and mantelpieces. The long attenuated pilaster is as bad. We see such pilasters to premises lately built in Oxford-street, rising three and four stories, 40ft. to 50ft. in height, and scarcely a foot wide; some of them rest on short panelled pilasters of only a few feet high, a simply ridiculous feat of architecture. The arch to a window is to be seen in another building monstrously deep, as if it had to carry tons instead of a few feet of wall between it and the sill of the upper window. Monstrous keystones are introduced for the purpose of ornament: some of these support pilasters, others carry balconies and oriels, and are converted into sundry offices. The keystone is a much-abused feature of the weak architect; if he makes it large and conspicuous, he saves himself a good deal of thought, as it is dotty and looks pretty in the design—indeed, if we were asked on what features the mediocre architect relied most for effect, we should say they were the pilaster, the arch, and keystone — sadly misused details wrested from their proper duties and made to serve as ornament. The gable mania—one of the outgrowths of "Queen Anneism"—has been widespread. The gable is everywhere thrust into view where its office is not evident; places are invented for it on walls and even chimney-stacks, and the gabled wall-tablet has become one of the appropriated details of the style. We may wonder sometimes that so useful a feature—the expression of two sloped roof sides—should have become so popular as an ornament: it is a good instance of the pertinacity with which the mind clings to a form—an example of the transmission of a structural type. But the architectural "ranter" uses it much in the same manner as the "clap-trap" orator spices his harangue with expletives and adjectival expressions; pedimental forms are stuck upon every object—not only doors and windows, but jambs, stringcourses, cornices have them studded here and there, with the only object apparently of arresting the eye, as the speaker's adjective or action does the ear. Another species of "rant" is carving, when it is obtrusively made to allure the eye without any appropriateness, It covers a multitude of weaknesses in the mind of the sensational architect, and the public accept it as evidence of art!

The foregoing are a few of the qualities which are apparent in our town architecture; those which it is in need of are equally evident to the artist—they are as painful to him by their absence as their counterfeits are agreeable to the vulgar taste. The commercial and sensational architect indulges in a language of his own, which, because it is popular, is more likely to supplant truthful architecture. In towns the open façade—that is, one with plenty of window and little solid—is almost a necessity; but it has favoured a light and frivolous style at the expense of breadth.

Now that the scaffolding has been removed, the new building of the Tivoli Company in the Strand affords an example of a dignified treatment combined with lightness. A single order of marble pilasters resting on low pedestals which project from the basement impart a degree of unity to the façade, unobtainable if the single order had been broken up into two or more. Between these are a range of slightly projecting bay windows, and another set of mullioned windows above. The design, apparently suggested by the Valmarina Palace, has been spoiled by the heavy attic above the main cornice, and the crowded windows at the top and between the capitals and broken entablatures. There was some promise of breadth before the attic was added, and the upper part had been crammed with windows. Solidity of effect can only be obtained by a certain amount of imperforate wall. It is this quality which makes the architecture of such cities as Glasgow and Leeds so different from that of London and Manchester and the great cities across the Atlantic, where commercial enterprise bids fair to reduce our street buildings to huge show-cases.

The remarks on texture and individuality made by Mr. Rimmington, R.P.E., the other day at the Society of Architects, are particularly to the point. Architects of the school we mention have no idea of the true value of "texture"—that is, variety of material and treatment of surface, for believing that they cannot have too much of it they destroy its effect on the eye, they fritter away their whole design, and leave not a square foot of plain stone to give value to the ornament. "Spaces of quietude and relative smoothness," as Mr. Rimmington says, are absolutely necessary; this is why we can enjoy the buildings of Mr. Pearson, of Mr. Graham Jackson, of Messrs. George and Peto, of Mr. Sedding, and Mr. Norman Shaw, in all of whose work we shall find "texture," or, as it may be differently expressed, the value of ornament and plainness, roughness and smoothness, light and shadow, the quantities in each case being properly distributed, and bearing an artistic or harmonic value to each other. Only an artist, like a musician, can tell when these qualities are agreeably balanced, when the combination of basses and trebles produces harmony. The nicer gradations of "texture" are equally well illustrated in the keen and severely-cut lines of a Greek building, and in the broken, disjointed, and rougher lines of Renaissance and Gothic, produced by broken-up surfaces, or those produced by rich tracery and ornament. Compare, for example, the severe and sharp lines of St. George's Hall, Liverpool, with the Manchester Town Hall, the sharpness and decision of Amiens with the florid surface ornament of the front of Troyes Cathedral, in each case the richer example

suggesting warmth. With regard to the principle of individuality, it has been carried to the verge of eccentricity by those who regard it as the sole merit, and who seek it at the expense of all other qualities.

A COMPETITION CODE.

ON one or two previous occasions we have shown that badly-conducted and abortive competitions have been the results of a want of unanimity amongst the profession quite as much as from the ignorance of competition promoters, who cannot be blamed for issuing catching invitations for designs to a body of men who are willing to enter the lists upon any terms. If any good is to be done, architects must combine to impose their own terms. Some time ago the Institute established a code of rules, which is generally acted upon by members of their own body, but is, unfortunately, of no value to five-sixths of the profession, who are free from any allegiance whatever to it, or indeed to any other society. What is true in this country is even more so in other larger countries like America, where the bonds of union are perhaps less close. The committee of the Western Association of Architects have lately been engaged on the subject, and have sent in a report on the statistics of competition in the States to the Convention of the American Institute held in Cincinnati. This report enters very much upon the same ground as that which the committee on Competitions brought up some years ago, and the action they have taken is almost precisely on the same lines. The managers of competitions have been appealed to, and objectionable terms pointed out. In a large competition in a large Western city, the chairman wrote pointing out the terms, which gave no protection to competitors, and offered to advise certain changes which experience had shown to be necessary; the committee also enlisted the aid of reputable members of the profession. To these appeals no reply was made. In the St. Louis City Hall Competition more success has attended their efforts, as the managers accepted the suggestions, and the code adopted by the St. Louis committee is certainly a step in the right direction, and is thought to constitute a precedent for all future competitions. It is worth notice, too, that the conclusions of the committee are very much like those which many leading architects here have formulated. As usually conducted, competition is thought to be not only "unnecessary, but positively detrimental to the profession and to the architecture of the country." This is chiefly attributed to the method of decision: expert juries are rarely called, and "when they are, their decision is treated as suggestive rather than conclusive." We have had ample opportunities of observing that in many competitions in which assessors have been appointed, their decision has been either over-ruled, or, what is more commonly the case, the terms or instructions have not been drawn up by the assessor, and he is thereby unable to exercise that discretion and independent judgment which he could do otherwise. In several instances these conditions have become hard and fast rules, and he has been obliged to regard them in common fairness to the competitors. For example, in many competitions the superficial quantity of floor space for each room is defined. One competitor may have made a desirable departure by increasing the size in one room, or diminishing it in another; while a second may have strictly adhered to the condition, but have sent in a design of a much inferior kind. Or the limits of the boundaries may have been departed from in one case to the evident advantage of the plan, though the assessor would be compelled to award the prize to the next in merit who had carefully complied with the instructions. In the matter of finishing, shading, or colouring drawings, the instructions issued may much interfere with the assessor's opinion of the merit of the design, if a strict compliance was enjoined not to shade or colour. Hence the instructions may often be so framed as to exclude original thought and artistic merit.

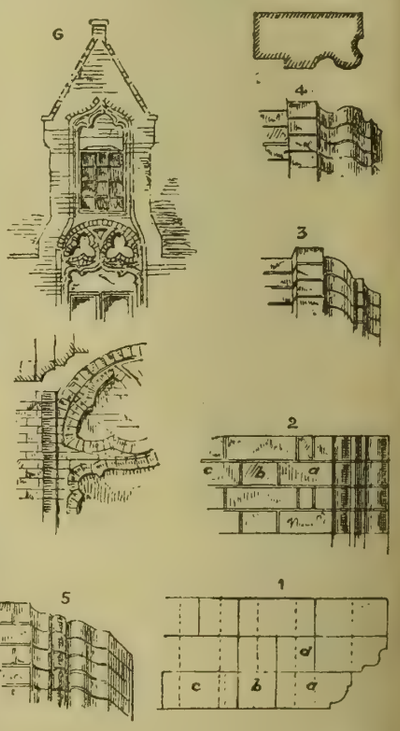
The organisation required to effect modification of the terms offered by competition promoters must necessarily be of a very complete character. The committee to which we have referred mention how very seldom they hear of competitions early enough to secure the revision, and appeal to all members of the profession to notify to the committee immediately they hear of a contemplated competition, and refrain from accepting unsatisfactory terms until the promoters have been communicated with and better conditions sought. We know how very partial has been the result of these appeals here. Though the Competition Memorial Committee obtained the signatures of a very large number of the profession in England, very few of those who signed have strictly complied with the conditions, and for the obvious reason that many of the signatories belong to no organisation of a binding character. Only those who are Institute members have complied with them. In America our brethren have done better, and have the wisdom to see that amalgamation of the existing bodies of architects is the only way of securing the unanimous acceptance of conditions on any desirable subject of professional practice and etiquette. The American Institute and the Western Association of Architects have joined hands, and the consolidated body or "Institute," as it will be called, will be able to secure a larger number of adherents than hitherto. The articles of membership will exclude those whose practice has not been in harmony with the constitution, while it will open the door to all practising architects who can show photographs of completed buildings erected from their designs and under their supervision and other credentials of ability. Under this united and consolidated body it will be possible to obtain a general consensus of opinion on competition and other questions which, under the divided authority of two societies, it was difficult to secure.

The code of competition proposed for the City Hall of St. Louis presents several points worth attention. The condition that all plans submitted are required to be drawn to a scale of one-sixteenth of an inch to a foot may be accepted for large buildings—we prefer an eighth of an inch. The former is, however, the stipulated scale in the cases of our Sheffield municipal buildings and Harrogate baths competitions now pending, but is rather small, except for buildings of considerable dimensions. Line elevations are alone admissible, though the windows may be tinted to show glass. The plans are to exhibit each floor, each elevation, and one cross section. Additional sketches are allowed to show particular features of rooms that cannot be shown on the plans and section. Another condition states that "Parties who so desire may include perspectives in pen and ink drawn to the same scale as the plans and elevations from a standpoint distant 400ft. from the nearest part of the building, the fronts shown to make equal angles with the plane of the picture, and the horizon to be 10ft. above the base-line of the building. The perspectives to be without shading or landscape or other accessories, except a human single figure 6ft. high to give the scale." A more complete instruction as to perspective drawings we can hardly have, and we commend the condition to those who have the framing of instructions. We think the distance of point of sight named necessary to insure a natural appearance; a much nearer view is apt to produce distortionate effects, and we agree that the distance should be fixed, and the angle at which the line of sight is drawn should be determined. Of course, each case must be considered on its merits, and the point of view should be so fixed with regard to locality as to give the effect of the building from the most available position. The importance of a readable description of a competition design cannot be overrated, and we think a "type-written description" is a good suggestion, giving "information as cannot be shown on the drawings concerning materials, methods of construction, and decoration." Other conditions enjoin strict secrecy as to authorship, anyone disclosing identity, influencing the decision of the members or their adviser, or exceeding limits of cost more than fifteen per cent. being excluded. These are the chief points in the code. There is one other recommendation worthy of notice, and that is that the successful competitor should be paid for extra services rendered in making amendments to his accepted design, particularly as there is no interchange of thought between him and the promoters, as in the case of a private work where the client can consult his architect at every step of the work. In the schedule of charges the committee therefore recommend the rate for competitive services to be fixed at six instead of five per cent., making the charge for preliminary studies rendered in competition two per cent. These studies in the case of competition are particularly severe, yet in many advertisements and instructions the five per centum is made to include every service, and very often the premium.

ARCHITECTURAL BRICKWORK.—XXV.

MOULDED BRICK JAMBS.

THE manner in which moulded jambs may be worked will depend on the thickness of wall and the mouldings introduced. We have shown the bond of piers having square



jambs, and we now give in Plan 1 the method that may be adopted in moulded work. The chief point is to break the joints so that they may not fall over one another. In the sketch we give of a brick-and-a-half wall, *a* represents a stretcher on face moulded on edge, next to which, also placed stretcherwise, is

another moulded brick, and at the internal angle of jamb a plain stretcher. The dotted lines show that these are crossed in the next course by the same moulded bricks placed headerwise, so that a good lap and bond is obtained. The other portion of the wall on one course consists in front of a header, *b*, and a stretcher, *c*, these being on the next course a closer, stretcher, and half-header respectively, as indicated by the dotted lines, which show a lap of 2¼in. The elevation 2 represents the arrangement in the front. Other modes of bonding may be adopted to suit the class of work. A closer, *a*, is introduced in one course. If the reader turns to p. 689, Fig. 3, he will see the bond of a square pier of one-and-a-half brick. The corner header or three-quarter brick on the left-hand side can be made a moulding as in *a*, and the outside stretcher (right-hand side) be similarly moulded; but when a double moulding, as in our present plan, is required, the two inner jamb bricks must project; hence the arrangement of bond we have shown.

Sketches 3, 4, and 5 represent different forms of moulded bricks. No. 3 shows a quarter-round or ovolo between two squares, the outer fillet projecting, and a cavetto brick inside. This and the next moulding (4) both project from the face of wall, and produce a pleasing finish to the opening. These moulded jamb bricks are each in one brick of the ordinary size; in one course the brick is placed as a stretcher and in the next as a header, so that the bond can be easily worked. For this purpose the moulding on face must correspond in width with the same moulding seen as a header, so that the same brick, when reversed, will coincide. Fig. 5 is a richer and fuller moulding, which would be better worked in two bricks, as in plan 1. For window openings and ordinary doorways the torus and cyma (Fig. 4) are useful kinds of bricks; but for important doorways the moulded jamb should be wider and deeper, so as to give a bolder splay to the jambs.

BRICK TRACERY.

In sketch 6 we show a portion of a dormer to a hospital in Bruges (St. Jean), executed in brickwork. The windows are set within a recess, the edges of which are moulded. The traceried head of the lower window is an interesting example of the cut work of the Low Countries. The trefoils of the tracery are made with joints which radiate to the respective centres; the bricks have a plain hollow worked on the edge. The best way of executing a traceried head of this sort is to make a full-size drawing on a board and fit the several bricks or voussoirs to it; any cutting or rubbing can then be done to make the curves and cuspings true. In some of the Italian examples we find pointed arches with the joints made to radiate —not with the proper centres of the curves, but from one centre, a plan preferred by some cutters to obviate the wedge-shaped key at the point of the arch. The "bird's-mouth" key is often used in pointed arches in which the angle is cut in the key-brick, instead of being a joint. This plan is resorted to in elliptical-shaped arches and "schemes."

EXAMPLES.

Some very beautiful examples of traceried heads are met with in Belgium. The Mont de Piété adjoining Notre Dame, Bruges, is an instance. The gable end is enriched by a large pointed arched recess, inclosing three bays of windows. The arch itself is trefoiled, and these foils are cusped with lesser arcs. The centre bay of windows rises between the cuspings, and the heads and panels between the windows, which are square, are panelled with tracery. Adjoining the Cloth Hall, Ypres, are three traceried heads within elliptical-shaped arches over the windows, and these have Gothic cusped tracery of very elaborate character. In Germany are many examples of window heads of cut brickwork; these are often simply cusped circles. A very notable work of this description is to be seen in the fine Gothic brick Rathhaus at Lübeck, of the middle of the 15th century, where the high, stilted pointed arches have brick cusped circles in the heads. To this example we shall refer again when we speak of moulded brick windows and other features.

ARCHITECTURAL ASSOCIATION.

THE fifth ordinary meeting for the present session was held on Friday evening, Mr. Leonard Stokes, President, in the chair. Messrs. O. E. Blayney, C. B. Hutchinson, H. Burman, J. H. Bolton, O. G. Beiter, J. Richmond, W. G. Goodwin, W. E. Hazell, A. R. Hennell, G. G. Irwin, and H. Bailey were elected members.

"DRAWING."

A paper on "Drawing," illustrated by sketches and engravings, was read by Mr. Reginald T. Blomfield, M.A. The lecturer observed that, whether one wishes to make an architectural drawing oneself, or to criticise it fairly when made by somebody else, the first thing to do is to form a clear conception of the specific purpose of the drawing in question. Broadly speaking, drawings are made to answer one of three purposes. Either the drawing is a shorthand note, the place of which might be taken as well by writing; or, secondly, it has for its object to make an accurate record of natural objects, including therein the works of man; or, thirdly, the drawing is a technical method—that is, it is the technical language in which the designer expresses his own ideas and makes them intelligible to the minds of others. Stated thus, the simplest form of the third division would be a set of working drawings. I do not refer, however, to these, but to decorative design in black and white. I propose to deal with these three classes of drawing in the order in which I have given them, and I shall do so from the standpoint of the architect. With "shorthand" drawings we are all of us familiar. Most of us have stood on the rungs of precarious ladders with our note-book and 2ft. rule, and broken our shins in dingy lofts, in our all-consuming zeal to get at the very thing itself—to get on our paper, by hook or by crook, such details and sections and measurements as will show us how the thing was actually made; how some obscure moulding really did intersect or die out in an unsuspected corner. Notes take the place of drawings, and *vice versâ*; any scribble is good enough, provided it tells the story. Architects, indeed, have almost a monopoly of this sort of work. When a painter makes an anatomical study, even of the roughest description, it cannot be matter of indifference to him how he makes his drawing. He must consider his method, for unless he pays some attention to his shading, as well as to the correctness of his outline, he will get wrong with his planes, and his notes will have no subsequent value. But an architect wishes to make a note of some detail. His drawing may be rough, dirty, and dilapidated, but provided it is correct and complete, the method is immaterial. The deftest touch in the world is as nothing to his purpose as compared with mere scale accuracy. To put it shortly, the object of his drawing is rather psychological than artistic, and the process is this. He sees a piece of work which he admires; with no conscious intention of copying, he notes so much of its structure as would enable him, if necessary, to reproduce it exactly. This he does partly by drawing, partly by written notes, whichever comes readiest to hand. The value of this work is not in the result—that is, in the various scrawls and other hieroglyphics which cover the page; neither is it in the crib of somebody else's idea. The value of such work is in the mental process itself. During all this time the mind of the sketcher is, or should be, busily at work assimilating the new idea, and laying up a fresh store of material for his mind to work on, adding, in a word, to that vast reserve of facts and observations which lies behind the consciousness of every genuine artist. This being so, the method of drawing employed becomes in theory, as it certainly is in practice, a matter of complete indifference. It is of no importance whether the lines are thick or thin, adroitly sketched or ploughed in from the elbow. The essential point is the amount of thought which they imply. To make a good detail of a piece of architecture on the spot, and against time, requires considerable power of analysis, besides much previous knowledge. A truly architectural mind possesses in a high degree the quality of versatility—quickness to grasp existing conditions, and readiness to turn them to account. An architect should be, like Ulysses, πολυτροπὸς πολυμήτις, "quick to turn, of many wiles," and, I believe, such a quality of mind can to some extent be acquired by this habit of trying to master the intention of any given piece of work, and transferring the results of one's thought to the paper by the simplest available means. If, then, this view of the object of an architect's sketch notes is correct, any criticism on the drawing itself becomes irrelevant. The drawing is a sort of "go-as-you-please" process. Smudges on the paper are immaterial. These may be only the honourable scars of the rain and wind; and the point of importance is the mental condition of the sketcher himself. Any advice on this point is outside the range of my subject. Drawing, then, as far as we have considered it, is out of relation to art. It is not till we come to the second class of drawings, those intended for purposes of record, that the æsthetic question enters into the case. The standard is higher than what is commonly accepted as sufficient for the record of architecture or work in any of the other arts, and I shall therefore limit my remarks to the latter class of subjects in dealing with record drawings. Now, bearing in mind the principle of our classificatisn, the first point to be determined is, What is the purpose of this sort of drawing? Take, for instance, an old building. Is it our object to make an exact scientific transcript of this, or to record the impression it actually makes on us personally? If the first, the scientific methods must be followed. We must proceed by plan, elevation, and section. In other words, make a set of working drawings of the building in its existing state. This, though of course invaluable for its own purpose, is an affair for the mechanical draughtsman and the archæologist, not for the artist. Moreover, it always seems to me that the scientific method, like many other scientific methods, is singularly unscientific. It proceeds by eliminating half the elements of the problem, and then is undoubtedly able to furnish you with a very clear statement of the remainder. Thus, the scientific draughtsman makes his drawing to scale. He even shows every stone in its existing position, but he gives no suggestion of the weather stains on the stones, and no indication of the effect in perspective. That is to say, he leaves out of account texture and grouping, the two most important points in the whole matter. The record drawing is of a different order. With the impression which a building makes on the mind, exact knowledge of its dimensions has very little to do. The grouping of its different parts, the texture of the wall surfaces, the shadows which actually fall on the building, the lights and the reflected lights, these and many another detail which escapes the scientific draughtsman, are the elements which go to build up our idea of the building as it actually is, and if the record fails to give these, it fails, to my mind, in its primary purpose. Now the scientific record gives no reasonable suggestion of all this detail. Moreover, it deliberately ignores the element of individuality. What charms one in Hollar is not so much, or not only, the actual buildings which he drew, but Hollar's own delightful way of looking at things, and the reflex of this in his method of presentation, but it is just this very personal element that the scientific method purposely obliterates. If, therefore, we wish to hand down to posterity some record of a building as it affected you and me, and anyone now living, we must seek some other method, some method which will take account of storm and sunshine and the slow influence of time. This method must be drawing of a very high artistic excellence. Whoever takes it in hand must have the power of drawing accurately whatever he sees, and correct perspective will have become to him almost a matter of instinct; but to this must be added the rarer gifts of selection and self-restraint. There are different ways of understanding accuracy. One notion of it is to draw in every detail with undeviating monotony, because they are all on the building itself. Yet the result may be simply inaccurate. A laborious drawing which draws in every moulding, and attacks each scrap of carving with obstinate conscientiousness, will give an impression of the building

which, if not absolutely false, will be very far less true than a sketch by a sympathetic hand, which hides half the detail in shadow, or leaves it out as bathed in a flood of sunshine. You may recollect Heine's description of the view from the Brocken. "It is," he says, "like a map, dryly drawn, and purely coloured, but without a single beauty for the eye to rest on," and this, he continues, "is just what happens to us German compilers, owing to the conscientious exactitude with which we try to tell every scrap of the story, without the power of bringing out details with a special and peculiar charm." It is just this power which is so fatally absent from most of our architectural drawings. Even in detail sketches, such as simple studies of carving, it is wise to use this subordination, to put your labour and delicate finish into one particular part of the drawing, and to leave the rest in suggestion. The eye and the mind can only take in a certain amount at once, and it is no good trying to choke people. Anyone familiar with the drawings of the great masters, Rembrandt in particular, will know that to do this well is no trick, but consummate art. It implies that you are master of your material, instead of being overpowered by it. In the case of drawings of buildings or groups of buildings this accuracy as a whole, in the spirit, not in the letter, becomes of the first importance. You must first get to the idea of the building—that is, try to make out what the designer was actually driving at; and then you must form some conception of the effect you are to aim at yourself, and determine, for instance, whether you will dwell on the detail, or on the outline against the sky. And then, to interpret all this into black and white, you must keep a firm hold on your values—that is, you must never lose your grasp of the subject as a whole, and you must resolutely sacrifice all that is unimportant, in order to bring out the essential features. Nothing is gained by trying to take your subject by storm; you probably end by falsifying the proportions of the building, or suffer the ignominious defeat of not getting all you intended on the paper. As to the style of drawing, so much good work is done in utterly different ways, that it is almost impossible to point to any one method as the only right one. For details such as carving, it would be hard to surpass the delicate pencil work of Mr. Ruskin and some of his followers. The sort of tentative touch which feels about, as it were, for the form, and in good hands seems to build it up as it goes, gives a nearly perfect suggestion of texture and modelling. But, when applied to groups of buildings, this method is apt to fail; perhaps it is betrayed by its own fondness for detail. The artist must go at his work in a larger spirit, he must have a feeling for great spaces of light and shade, and still more for those highest qualities of architecture, mass and outline; and this will mean that he must deliberately sacrifice much of the detail. Mr. Fulleylove has made some beautiful drawings in this larger manner. One quality in common is shared by all good architectural drawings, and that is the complete absence of trick and affectation. If the lines are few, they are true and to the point; if there is shading, it is there for some well-ordered purpose, and not scattered about at random, without thought of the effect as a whole. Perhaps one of the commonest temptations to an immature draughtsman is to "crisp up," as the odious phrase is, a dull, heavy sketch by spots of dark shading judiciously peppered over the drawing. The artifice is too transparent to be of the smallest value; it simply directs attention to the faults of the drawing, like a fine jewel on an ugly neck. A good way to avoid this trick is to begin by using only one pencil—say an H.B. There are dangerous seductions in a B. or a 6 B. Another useful rule is to avoid cross-hatching. It is best to begin, at any rate, with open line drawing—that is, by shading with lines deliberately drawn side by side. The very finest drawings in the world have been made with open lines, and, apart from this, the practice has this advantage, that you can never deceive yourself about your own drawing. After a certain amount of practice you may acquire that lightness and freedom of touch, and that sure rapidity of execution, which are the finest qualities of pencil drawing. The essential thing is to avoid trick; or, if you must have tricks, at least to form them for yourself, and not borrow other people's. Pencil drawing, in regard to the modern methods of illustration, is of less importance than pen-and-ink work, owing to the facility with which the latter is reproduced. It might be expected that architects would excel in pen-and-ink work; they have considerable practice in it—yet, to judge by the works of the architectural draughtsman, there is no form of artistic drawing in which they more conspicuously fail. Of course, there are some eminent exceptions to this, but I take the average. We are all familiar with the architectural draughtsman and his ways. He takes a house by John Doe, and a church by Richard Roe, and with his unfailing recipes he turns them out as spick and span as if they grew from the self-same brain. Indeed, I believe there is a machine for the manufacture of perspectives, and if there is not, it would only be the natural development of this ungodly drawing. A line drawn one way represents stones; turned another, it does for bricks; ruled straight, it represents slates; ruled with a crick, it is taken for tiles; a sprinkling of scriggles does for trees; and marvellous convolutions of lines, neatly broken off at a fixed point, are understood to be clouds. The figures come from old fashion-sheets, and the dogs and horses from the Noah's ark of the draughtsman's childhood. The whole thing is a trick from end to end. It reminds one of the instructions given by the British workman to his apprentice on the methods of graining. "Meoggany," I says, "and you combs it so, and puts twiddles with a rag. Then I changes my mind, and I says oak, and you up and combs it lighter, and puts the twiddles t'other way. Then I says wornut, I says, and you makes it werry dark, and turns the twiddles upsey down. Then I up an' says 'marble,' I says; then you paints it black, and shies a hegg at it, and there's your marble." No wonder that if this is understood to be architectural drawing, the very name of it is a byword of contempt. Not only are the trees not like trees, and the figures wooden, and the animals ridiculous, but the architecture is not like architecture. This uniform monotony of straight-ruled lines, varied by certain tricks of the trade, quite fails to give any notion of the building, not only to the layman, but to us, the learned in the 45° and T-square. The standard of drawing among architects has certainly risen in the last few years, but the architectural draughtsman still flourishes in our midst, as any one can tell from the abundance of his works, and the numerous publications of measured drawings and sketches by men who seem to be unfamiliar with the rudiments of black and white. In regard to the latter it is a mistake, as a mere matter of advertisement, to publish drawings unless they have some artistic excellence. The public does not look at these things, and architects take them at their proper value. If, as architects, we are to be worthy of our claim to be artists, it is high time that this sort of work should be discredited, even if it is necessary to throw overboard the cherished delusion that it is in the power of any one, with the help of a few trade tricks, to turn out a satisfactory architectural drawing. In point of fact, it is not given to everyone to be a fine draughtsman; it is not given to one architect in fifty, and the sooner we recognise our limits in this direction the better for our reputation. After all, a man can be a great architect without being a great draughtsman, and though, as I believe myself, noble ideas sometimes get marred by the designer's inability to get them out on to paper, the amount of drawing power which is necessary for this purpose is quite a different thing from what constitutes fine draughtsmanship, and that this is so is proved by the beautiful works of architects who are not pre-eminently distinguished for their skill in drawing. It is not necessary to pitch one's T-square into the fire because one feels unequal to good pen-and-ink work. Perhaps it would be wiser to leave it alone, or if it is absolutely necessary to assert your existence at the annual Academy show, to go to someone who understands the business. The remarks offered in reference to pencilwork apply in the main to pen-and-ink drawing; but there are one or two limitations in the latter which require attention. It is best to get over the ordinary difficulties of drawing correctly before taking to the pen; for the latter is by no means so kindly as the pencil; and it is a very different thing to rub out a pencil line and to scratch out a detail in Indian ink. So far as regards abstraction and selection, much the same principles must be followed as in etching. Pen work is the directest form of black and white, and as much depends on the white as on the black; in other words, a skilful artist tells you as much by what he leaves out as by what he puts in. Mr. Pennell is extraordinarily dexterous in his power of omission; he is only surpassed, perhaps, by Vierge, the Spaniard, and some of the Frenchmen. As compared, however, with etching, the pen moves much less freely over the surface than the needle, and a person with a clumsy touch constantly finds his pen digging holes in the paper. To avoid this you should cultivate a light, free handling of the pen—what the French would call "légèreté"; and, as a general rule, it is wise to avoid cross-hatching, partly because you scratch up the paper, partly because you sacrifice too much of the white. Mr. Railton, however, sometimes cross-hatches with admirable effect. Another limitation of the pen as against the needle, is that the pen-stroke must be made once for all; to repeat it is to destroy its value, and you cannot bite it deeper. It follows, therefore, that you must think rapidly, and realise your effect with unhesitating decision, if you are to attain to the highest qualities of pen-and-ink drawing. Turnbull's Bristol boards, and any flexible-pointed pen, not crow-quills, are all the tools necessary—that is to say, if you work for reproduction—for in this case the drawing should be in the blackest of ink on the whitest of paper. If your drawing is not made with this intention, a smooth, tinted paper is much pleasanter to work upon. There is an excellent paper, not unlike parchment, sold for this purpose in Paris. It is impossible to deal with modern work; but I should like to call the attention of the younger members of this Association to Cotman's architectural etchings. Taken as etchings, they fail in the freedom and suggestiveness of first-rate etching; Cotman always tended to make his etching an engraving on copper. But as studies in black and white, for solid draughtmanship, for composition in light and shade, and for suggestion of texture, these etchings are unsurpassed; and for draughtsmen who feel that the marvellous tact and subtlety of a Vierge is entirely beyond them, Cotman forms a valuable model. The only danger is that his rather artificial method is apt to degenerate into trick in inferior hands; and, indeed, I believe that the architectural draughtsman, *pur sang*, might father some of his methods on Cotman. If, however, instead of copying his faults, you make for the great qualities at which Cotman aimed, you will, at any rate, steer clear of the flimsy and ineffectual draughtsmanship which appears to satisfy most of us. For insight into the spiritual qualities of architecture, Piranesi and Meryon stand absolutely alone. Not only were they both consummate masters of the line, but to this they added a far-reaching imagination which gave to their drawings of architecture much more than a merely technical interest. These two men have placed the poetry of pure architecture beyond the reach of challenge, and the one is the correlative of the other. Piranesi found in Classical buildings material for a sombre fancy that had its pleasure in great masses of masonry and endless vistas of colossal architecture; and for once in a way an artist of first-rate power selected as the vehicle of his ideas architecture in its most abstract form—architecture unclothed by sculpture, and dependent only on its own great strength. I refer to the large prison series. It might well make us despair to turn from the midst of our little work, with all its prettiness and fussiness, to the terrific immensity of Piranesi's vaults, and the vast mysterious horror of these Titanic halls. Grandeur was the quality on which his genius was set. He showed the walls of the Roman buildings like the cliffs of the seashore. Piranesi must have revelled in the mightiness of the Roman work—his ear caught across the ages the echo of the workshops of the great imperial builders; and so long as modern civilisation lasts, there will be minds in sympathy with his and eager to honour him for his revelation of the spirit of a mighty past. And Meryon, for his part, had thought himself into the spirit of Mediævalism. His was a strange, wild nature, out of touch with his time, but in singular harmony with the supernaturalism of the Middle Ages. To Meryon's grim fancy the air was no mere oxygen and hydrogen, but the home of myriad spirits, and for him the powers of darkness would haunt again the lonely pinnacles of the great cathedrals. The "Stryge" expresses, to my mind, the very quintessence of one side of Gothic art, and you may find Meryon's innate

Gothicism again in his intense perception of detail. Meryon and Piranesi have given us the highest level yet reached in the interpretation of architecture, and between them they cover the whole range of its expression in black and white. It is a curious coincidence that in both cases their rare genius ended in madness. We have hitherto been considering record drawing in relation to objects already in existence; but the question arises, How are we to deal with drawings of objects, buildings, let us say, which exist only upon paper, or in the designer's mind? The problem is certainly difficult, and we are not helped towards its solution by the practice of the day. The architectural draughtsman solves it by the recipes of his office, and his method is utterly unsatisfactory. On the other hand, some of the most successful draughtsmen of the day anticipate the effect of some 200 or 300 years on their buildings. They reproduce in their drawings effects which they have already annexed and made much of in sketches of actual buildings. This, though an attractive method, seems to me to fail in honesty of purpose. We must, as usual, look to the practice of the great men of the past for the answer. I do not recollect myself in any of the architectural sketches of the great Renaissance architects any such merely pretty sketches, on the one hand, or such elaborate masterpieces of monotony on the other. Inigo Jones, our great master in architecture, used to make free-hand sketches of his work, roughly hatched, or in more detailed drawings he would rule in a few of the more important lines, and sketch in the rest, and tint in monotone. He made little or no attempt to give the effect of an old building to a new one. With characteristic contempt for futility, he appears to have thought it a waste of power to devote any more trouble to a drawing than was necessary to bring out the purely architectural qualities of a building; and his simple slashing method was exactly suited to the purpose. The system of painfully working up each detail came in with the Epigoni, with the inferior men of the 18th century, who hoped to hide the poverty of their endowment under a mass of laborious finish. This is very much what has happened among ourselves. The third division of my suggested classification is drawing as a technical method; that is, drawing of which the primary purpose is to express, in line, an idea in the designer's mind. At first sight this seems to approach the first division, in which the drawing is entirely subordinate to the mental process; but it differs from it, in that in this third division it is impossible to separate the idea from its expression—the two work themselves out together in the mind of the designer, and thus it is separated from mere shorthand work by the importance which it is to claim for its method. And, again, it is separated from record work by the fact that it deals, not with the transcript of an idea either already realised or having a value independent of the drawing, but with an idea in the designer's mind, the object of which is attained by its expression in the black and white design. That is to say, it does not depend for its *raison d'être* on its realisation in some ulterior material, whether past or future; but when the idea is once expressed in the design, let us say on paper, the idea and its expression together form a complete and independent work of art. Realism, therefore, is not so much the object as the most forcible expression of this idea; and everything which interferes with that expression—such as excessive imitation of texture—is superfluous and wrong. This, to put it shortly, seems the intention and justification of the very conventional use of black and white, which is most perfectly exhibited in the works of Albert Dürer or Lucas van Leyden, and the little masters. You take a woodcut by Dürer. There is no suggestion of merely imitative realism, and yet every line tells its story; each line suggests the field of thought in which the mind of the artist has been at work. The lines seem to be dashed into their place without effort, yet each is burdened with thought—it is there as a factor in one organic whole. The twenty-ninth plate of the Little Passion represents Christ rising from the tomb. In the left-hand corner is the sun just showing above the fields. The rays are given by single lines radiating from the sun. Nothing could be more simple, almost rudimentary, than the means employed; and yet it is impossible to conceive of any method which could suggest more vividly the strange supernatural light, neither night nor day, in which Dürer has represented this intensely mystical act. It would be clearly absurd to criticise such a drawing on the score of its disregard of realism, for so such thing was ever attempted, and I do not see myself the slightest necessity for attempting it in work of this sort. There is the primary objection that to do so distracts the mind from the main idea. Moreover, any representation of an object in nature, short of actual facsimile copy modelled in the solid and coloured, only resembles that object by convention, and through the force of association and knowledge. There is, therefore, nothing illogical in making a further demand on this convention, and confining your imitation to what is strictly necessary to suggest the idea of the object in question, with this limitation, however, that the greater the artist's ability, the profounder will be his insight into the character of any object, and he will therefore suggest its essential qualities instead of mere accidents. All kinds of decorative work in black and white, and the line, book decoration, the designing of advertisements, broadsheets, circulars, and the like, form the proper field for this sort of drawing. I don't know who is responsible for the advertisements and postbills which make our hoardings hideous, but there always seems to me here a grand field for a good designer in black and white. Mr. Herkomer, following in the footsteps of Fred. Walker, set an example a few years ago with a well-known advertisement, but his example has not been followed, except in some rare cases where men of first-rate ability have been employed. Then, again, book-plates, title-pages, headings, and tail-pieces, all give fine opportunity for the skilful use of the line. The beautiful work of Mr. Crane, Mr. Heywood Sumner, Mr. Whall, and others, is familiar; and one other instance of an admirable design in black and white is a book-plate for this Association, drawn and designed by Mr. Lethaby. In regard to the method to be used, I shall only summarise what I believe to be the most important points. 1. The lines should be firmly drawn, and kept distinct, they should be of uniform thickness, and each line should be thought out. 2. If the drawing is to be accompanied by printed type, the scale set by the latter should be followed in the drawing, and the type used as in itself a means of decoration. Where it is possible, the type should be designed with the drawing. 3. Mere realism should be avoided, and the decorative standpoint sedulously adhered to. To come, then, to some conclusion in the matter. The point which I have endeavoured to lay before you is, that before making, and certainly before criticising, a drawing, a clear conception must be formed of the purpose of the drawing. A drawing may be made as part of an educational exercise, or as a simple shorthand note. Here the drawing is out of relation to art, and should be criticised from a totally different standpoint. Again, the drawing may be made to record some building or work of man, in its actual state and surroundings; and here I contend that the methods of the typical architectural draughtsman are inadequate and absurd, and should be permanently discredited. Drawings of this class require consummate draughtsmanship and knowledge, and are not a matter of hard sketching to be knocked off by any one. The standard of architectural drawing in this respect should be higher than it is. Thirdly, drawing may be used to present, in black and white, some conception of the mind; and with this a simple method should be adopted, which sacrifices all that distracts from the main idea, and treats each line as a matter of decorative design. To apply to one class the standard and principles of another inevitably means confusion and false criticism. It may very well occur to many of you that, after all, an architect is not primarily a draughtsman or a designer in black and white. No more he is; but this field of design is just one of those on the border-land between the province of the architect and the painter, which are rapidly slipping out of our control into the hands of specialists, so that day by day the work of the architect is being narrowed down to the strict limits of the planning and construction of buildings. Many a client to this day considers that in matter of taste he is the superior of his architect, and at this rate the architect will be relegated to the position usually assigned him by public bodies, of a superior clerk of the works. In the great days of architecture an architect was primarily an artist. He was supposed to do work not only for the sake of immediate profit, or even honour, but for its own sake. He might have taken as his motto "*Nolo quæ veris extra*." Nowadays, through indolence and timidity in yielding to the aggressive assertion of the business man, we have almost lost our claim to be considered as artists at all. Many of us must have winced under the phrase "architects and artists." It is time we combined against such an insult to our calling, and to combine means a determined individual effort along common lines. It means systematic resistance to what is vulgar and commonplace; and for each of us persistent self-cultivation, and an unswerving search for the most beautiful modes of expression in drawing and design. We are not very likely to develop the genius of a Meryon or Piranesi, but something at least may be done by the labour of love, and a sincere enthusiasm for beauty in art, which is not to be fobbed off with any tricks of the trade or traditional platitudes.

Mr. A. Beresford Pite, in proposing a vote of thanks to Mr. Blomfield, remarked that the subject was one of vital importance to every one present. He regretted that the lecturer had confined himself to one branch of his subject, which might be termed architectural landscape. Architectural draughtsmanship was very much influenced by one or two historic facts. Of these, the first in importance was that the student was now in the possession of some half-dozen illustrated papers, each publishing weekly some six or eight drawings. To these journals they were indebted for the extinction of the highest class of illustration—the steel engraving, and also of the lithograph proper—for henceforth no one would be able to afford to publish such a work as that of Professor Cockerell. Many men would much sooner possess one engraving or lithograph of the class executed by Cæsar Daly or the elder Cockerell than a whole shoal of the photo-lithos issued by the professional Press every week. He believed that they would rather pay 1s. a month for one good plate than 4d. weekly for the present journals, and he presumed a good field was open for such a high-class enterprise. Men wished to have their work reproduced, and hence they drew hurriedly, negligently, and with tricks to suit the style of the photo-lithograph. At the same time, if it had not been for the enterprise of these journals, the merits of men like Norman Shaw and others would never have become known. None of the pencil drawings reproduced of recent years could approach the genuine feeling evinced by Prout, Coney, or Cotman. The art of lithography had been almost killed by the photograph. Unless a man's drawings appeared in the professional papers, he remained unknown, so there was nothing for it for the architect but to make his drawings in the blackest of ink on the whitest of paper. Architectural drawings might be divided into the scientific and the imaginative classes. A working drawing was a highly technical composition without atmosphere and perspective, and was prepared in the most gaudy colours to serve a given purpose. In the most modern buildings there was, as a consequence perhaps of this method of draughtsmanship, a singular lack of proportion in the relief in the light and shade. There was no reason why architects should not practise imaginative drawings, why they should not largely draw their buildings for their own sakes, just as old work was sketched for its own sake. In ideal compositions by students he thought imaginative drawings should not only be recognised, but encouraged, and he should not be bound down to hard and fast lines. In the work of Piranesi we had an admirable example of this class of drawing, and also in that of Albert Dürer, the latter of whom revelled in powerful breadth of line, often without the slightest regard to perspective or atmospheric effect. It was dangerous to copy the tricks and mannerisms of any other artists. Students did well to analyse the work of such men as Pennell and Railton, and observe how they heaped in massive foregrounds, and suggested delicately glinting backgrounds, but it would be foolish to copy their peculiarities. Skill and facility were only to be attained by a long course of practice. He urged students to be careful in their work, and not to be discouraged at slow progress; he believed little could be done under four or five years of diligent sketching.

Mr. F. T. Baggallay differed a little from the lecturer on one point. He did not believe any man could become a great architect unless he was a good draughtsman. It was impossible for a man to conceive—that was, originate—in his mind a form which he could not draw after-

wards. He sincerely hoped that Mr. Pite would get someone to start a magazine, illustrated by steel plates; it would be very nice for those who bought such works, but the publisher must be prepared to drop a good deal of money.

The President, in putting the vote of thanks, remarked that Mr. Blomfield had a thorough mastery of his subject. The first point in examining a drawing was to consider the purpose it was intended for, as one could not criticise it unless one knew what was the aim of the artist. If it was made for reproduction one treatment would be adopted, whereas if it was simply for working from quite a different style would be employed. He would strongly advise students sometimes to make a drawing simply for its own sake and with no ulterior thoughts of reproduction. The value of draughtsmanship was in its execution and in the experience and knowledge it gave. Many men who sketched and measured numerous buildings hardly ever referred to the drawings in after years, for their minds had been well stored by the process of making them. He agreed with Mr. Blomfield's advice not to cross-hatch, nor to be at pains to put in every shadow in a drawing. The amount of license to be allowed to the draughtsman depended entirely on the purpose of the drawing; if for working from, the architect could not be too scrupulous about accuracy.

Mr. Blomfield, in his reply, said that many of the old lithographic processes, for which a plea had been put in, were very unsatisfactory in effect. The photo-lithographic processes, from a business or publishing point of view, were the best, as by them drawings could be reproduced quickly and exactly. An architectural drawing was a mere means to an end. The French had an elaborate system of showing by shading on an elevation the relative depths of the work; but the average English architect, and certainly the English builder, could not understand such a drawing. Suggestive methods of sketching might be, and often were, very much overdone; the impression the eye of an observer took in was not the detail, but the outline, and it required a high gift to indicate the effect of architecture by masses of black and white. Happily there was room and scope for every form of draughtsmanship. Probably in his paper he had understated the value of the power of drawing to an architect. His own view of the matter was that a man could not be a good designer unless he could draw well; but that it did not follow because a man could draw with facility that he was, therefore, a good designer. The preparation of drawings for reproduction had a bad effect on the architect, as it tended to *arrière pensée*, to an affectation that crushed out his individuality.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fortnightly meeting of the Institute was held on Monday evening, Mr. J. MacVicar Anderson, vice-president, in the chair. The decease of Mr. John Michelen Rogers, of the War Office, Associate, was announced.

THE ARCHITECTURE OF PROVENCE.

A paper on this subject was read by Mr. David MacGibbon, of Glasgow. The lecturer's recent work on "The Architecture of Provence and the Riviera" was reviewed in our issue of the 13th March last (p. 370, Vol. LVI.), when we published a sheet of photo-lithographic reproductions of the author's sketches. Architecture might, Mr. MacGibbon observed, be said to have been introduced into Provence by the Phœnicians, traces of whose work were still discernible in the harbours they had established. The Roman remains in Provence were of foreign origin, whereas he intended to restrict his attention to the native style of the country. Provençal architecture sprang up with the revival of the arts and letters about the time of Charlemagne, before which period the architecture of Rome everywhere prevailed. The mode in which Roman construction was continued in the West as late as the 9th century was well illustrated by the church or mausoleum erected by Charlemagne at Aix-la-Chapelle; and where Roman examples existed it was natural that the works of the Teutonic invaders should have been adaptations of them. In the native architecture of Provence would be seen all the Roman elements preserved and still in daily use until the 11th century; and their gradual change in the 12th century into a special form of Romanesque, in which the stages of the transition were clearly discernible, could be noted. Mr. MacGibbon proceeded to describe 24 examples, of which illustrations were exhibited by the lime-light. First was the Church of Saint-Paul-trois-Châteaux, the elevation of which might well be taken for a structure of the Late Empire, but was supposed to be of the 10th or 11th century. The porch of Notre-Dame-des-Doms was so strikingly ancient in character as to have long been regarded as a Classic structure; but was probably a work of the 10th or 11th century. The Sainte-Trinité (one of the early chapels on the island of Saint-Honorat-de-Lérins) was clearly an imitation on a small scale of Roman domical and vaulted construction. The Baptistery at Fréjus, on the Riviera, was a sample of other similar structures long regarded as Roman works. The celebrated Monastery of Montmajour contained several buildings of great interest in connection with the development of Provençal architecture, the Chapel of Sainte-Croix being a late example of an imitation of a Roman form of construction. The Chapel of Saint-Pierre, at the foot of the rock on which the monastery stood, was an example of early deviation from the traditional type of Classic columns and capitals. The Church of Saint-Trophime, Arles, exhibited two very fine examples of the fully-developed Provençal Romanesque in the western portal and the cloisters. The portal of the Church of Saint-Gilles was the most complete and most finished illustration of that Provençal style in which the Visigothic spirit prevailed almost completely over the Classic. In describing the vaulting in Provence, Mr. MacGibbon directed attention to the different forms adopted, and to the peculiarity that they were pointed and not round arched. The domes were next alluded to, and the effects of their employment on the structures subsequently erected in the whole of the south of France described and commented upon, especially in cases of church plans. The Cathedral of Fréjus had originally been an instance of the single nave or hall plan, aisles being added afterwards. These examples gave an idea of the various steps by which the Romanesque style advanced in the country up to the middle of the 12th century, and showed that a style was produced which at first borrowed its forms from Roman models, that they had been gradually modified by the Northern spirit, and continued to the last to rejoice in exuberance of decoration. Mention was then made of the rise of the Cistercians, and the style introduced by them. The Monastery of Thoronet was described as an example of the plain and severe style of the Cistercians. The cloisters of Thoronet and the nave of Saint-Trophime at Arles were also cited as examples of the same style. The introduction of Northern Gothic took place in the 13th and 14th centuries, spreading over the whole country, and producing a mixture of Provençal elements of construction and Gothic ornamental details, which was far from satisfactory, and of which Saint-Nazaire at Béziers and Saint-Jean at Perpignan were examples. Churches in that mixed style continued to prevail in the south of France until the 15th century, but the importation of Northern Gothic became more and more marked. Mr. MacGibbon then referred to a very important phase of the architecture of Provence—the military structures. The walls of the cities of Carcassonne and Aigues-mortes were deservedly celebrated as the most perfect representatives of the art of defence of towns as practised in the 13th century; and were both described by the author, as well as the walls of Avignon and the Abbey of Cruas. Villeneuve-lez-Avignon, the great castle of Saint-André, on the west side of the Rhone, presented many interesting features. Attention was then directed to the Watch or Keep-towers of Southern towns. Having briefly reviewed the course of Provençal architecture, Mr. MacGibbon referred to the castellated monastery of Saint-Honorat as a very interesting structure, in which were combined examples of all the styles of Provence, and, having given a general idea of the building, described the lower cloister and the upper one of Saint-Honorat in detail; the latter and other examples showed the Italian influence which prevailed over a large portion of the Riviera. The speaker concluded by stating that on the Island of Saint-Honorat there was ample evidence of its varied fortunes and of the different people by whom it had been possessed. On that island there was thus preserved an epitome of the varied architecture of Provence.

The Chairman, who had introduced the lecturer as a former fellow-pupil in the office of Mr. Byrne, said it had been interesting to trace, in the architecture of Provence, the Roman characteristics of the buildings growing into the Romanesque style, and finally being modified by the Gothic features imported from the North. The massive character of the work was apparent throughout, and afforded a suggestion to the architect who was willing to trust for effect to bold proportion and plain wall spaces.

Mr. R. Phene Spiers, F.S.A., proposed a vote of thanks to the lecturer. He agreed with Mr. MacGibbon that the early style of Provence took its form mainly from the Roman work already existing there, and that it was very little affected by Byzantine influence. In the work of that early period the great pride of the designer was to imitate the great buildings of the past. In many of these churches of Provence we saw the architects copying the old work around them as closely as they could, quite unconscious that they were evolving a new style. The treatment to be seen at St. Gilles, and also at St. Trophime at Arles, could be traced to Roman works in the vicinity, notably to the Maison Carré at Nîmes. Some French writers had gone so far as to ask whether it were not possible that the influence of Provence did not extend to Venice, instead of this district being influenced by the architecture of Venice. He did not concur with the lecturer that Byzantine influence could be traced in Aquitaine. The church of St. Frond, at Perigueux, was evidently an attempt to copy the plan of St. Mark's, Venice; but when the builders came to construct the pendentives of the dome they were puzzled, and virtually built web vaults of pointed outline. This was the earliest example of such treatment, and was such as would occur to any clever mason puzzled by the difficulties. A great part of St. Frond has been rebuilt of late years, and much altered in the restoration, which was badly done. The whole aspect of St. Frond was different to what we were accustomed to find in France, and led us to believe that some influence from the East caused this. As to the lecture, he confessed to some feeling of disappointment that the slides were taken from Mr. MacGibbon's drawings, and not from actual photographs, as it was possible to learn so much more from the latter; but the author's sketches had well stood the ordeal of the lantern reproduction.

Mr. W. White, F.S.A., seconded the vote of thanks, which was supported by Mr. E. P. Loftus Brock, F.S.A., who said the drawings had shown them a very different phase of Gothic to that to which we were accustomed in this country. One feature had not, he thought, received the attention it deserved. When Gothic work was executed in a Southern clime it lost its aspiring character, and became flat and heavy in outline, as we saw in Spain: this curious fact was well brought out in the drawings they had seen that evening. The light thrown on the development of Domestic Classic work elsewhere by the work in Provence was interesting. We know very little of the ordinary Classic work, such as that in houses, although familiar with it in temples and palaces; but we could glean a good deal of information of what that style was by tracing its development some six centuries later in Provence; thus we found peculiar little columnettes, such as those dug up on Roman sites, frequently employed decoratively in this district—of course, at a later period. He had been struck with the resemblance of the columns in the cloisters of St. Trophime with those in the crypt of Canterbury Cathedral, and he thought few were aware of the extreme beauty and delicacy of the latter work, which he believed was executed by a foreign mason. Mr. MacGibbon had brought out that the great bulk of the work in Provence was as like the Roman remains as could be, and they would find that the one was a continuance of the other.

Mr. E. J. Tarver, F.S.A., thought the early buildings illustrated were, as Fergusson held, the only ones which should be termed Romanesque.

Mr. Campbell Douglas, of Glasgow, said Mr. Spiers had deprecated the use of sketches rather than photographs for lantern-slide illustrations, but he would join issue with him on the point. Photographs were very well, and we were indebted to them, but sketches were better. When a man made a drawing of any building, the mere excellence of draughtsmanship and fineness of

lines were the chief end gained; but the chief points were impressed upon the retina of his mind. The photograph might be obtained for general mass and outline, but the detail needed to be exactly drawn for the architect's own use. Indeed, from the drawing, more would be gained by posterity, although it would not be so absolutely correct as a photograph.

Mr. R. N. Wilson and others having spoken, the vote of thanks was carried by acclamation. Mr. MacGibbon, in reply, said he had not asserted that the building of St. Frond had no influence on other domical churches, but that the undoubted fact that the plan of St. Frond was copied from St. Mark's at Venice was not sufficient ground for assuming that all the churches of that character were built under similar influence. (Mr. Spiers explained that French writers now asserted that St. Mark's was copied from the Provence churches. Mr. MacGibbon: Ah, my development in theory has not gone so far as that.) He agreed with Mr. Brock as to the great difference between Northern and Southern Gothic. He had been so struck by the amount of variety of treatment to be found in the Gothic architecture of Southern France, that he had gone into the subject of its development *con amore*. He would suggest that the architect who could arrange to take his holiday in the winter could not do better than go to Provence. He agreed with Mr. Douglas that sketching was more beneficial to the architect than bringing back a selection of photographs; but for others the latter were far more taking, life-like, and accurate than his poor sketches could pretend to be.

PRACTICAL ARCHITECTURE WITH DETAILED ESTIMATES.—LIX.

By Henry Lovegrove, F.S.I., Surveyor.

ESTIMATE FOR A VILLAGE ELEMENTARY SCHOOL.

EXCAVATOR.

ft.	in.	ft.	in.		
331	0				Dig, cart, and concrete foundation of walls in trenches 5ft. 3in. deep.
3	4				
1	6	1655	0		
331	0				Dig and cart, a part filled in and rammed.
3	4				
3	9	4137	0		
6	6				Dig, cart, and concrete for chimney breast.
	4½				
1	6	3	8		
2 3	6				Add angles chimney breast.
3	6				
1	6	36	9		
6	6				Dig and cart, a part filled in and rammed.
	4½				
3	9	9	1		
2 3	6				
3	6				
3	9	91	11		
50	6				Dig, cart, and concrete foundation to walls between classrooms.
3	4				
1	6	252	6		
4 6	8				Add.
	4½				
1	6	15	0		
4 4	8				Add.
	4½				
1	6	10	6		
50	6				Dig and cart, a part filled in and rammed.
3	4				
3	9	631	3		
4 6	8				Add.
	4½				
3	9	37	6		
4 4	8				
	4½				
3	9	26	3		
2 11	8				Dig, cart, and concrete walls of classroom.
3	11				
1	6	137	1		
2 11	8				Dig and cart, a part filled in and rammed.
3	11				
3	9	342	8		
6	6				Dig, cart, and concrete, chimney breast.
1	2				
1	6	11	5		
6	6				Dig and cart, a part filled in and rammed, chimney breast.
1	2				
3	9	28	5		
16	9				Dig, cart, and concrete, wall next lavatory.
3	11				
1	6	98	5		
15	0				Add.
3	11				
1	6	88	2		
16	9				Dig and cart, a part filled in and rammed.
3	11				
3	9				
15	0				
3	11				
3	9	466	4		
2 5	6				Dig, cart, and concrete, division wall.
3	6				
1	0	38	6		
2 5	6				Dig and cart, a part filled in and rammed.
3	6				
1	0	38	6		
15	0				Dig, cart, and concrete, wall boys' lavatory.
3	6				
1	0	52	6		
15	0				Dig and cart, a part filled in and rammed.
3	6				
1	0	52	6		
16	8				Dig, cart, and concrete, boys' lavatory, &c.
3	6				
1	0	58	4		
16	8				Dig, cart, and concrete, boys' lavatory, &c.
3	6				
1	0	58	4		
16	8				Dig and cart, a part filled in and rammed.
3	6				
1	0	58	4		
4 5	2				Dig, cart, and concrete.
3	2				
1	0	65	5		
4 5	2				Dig and cart, a part filled in and rammed.
3	6				
1	0	72	4		
2 5	6				Dig, cart, and concrete, for buttresses.
2	3				
1	6	37	2		
2 5	6				Dig and cart, a part filled in and rammed.
2	3				
3	9	92	10		
4 1	6				Dig, cart, and concrete 5ft. 3in. deep, piers to porches.
3	4				
1	6	30	0		
2 4	7				Add angle columns.
3	4				
1	6	45	10		
2 4	0				Add columns.
4	0				
1	6	48	0		
4 1	6				Dig and cart, a part filled in and rammed.
3	4				
3	9	75	0		
4 4	7				
3	4				
1	6	91	8		
2 4	0				Add.
4	0				
3	9	120	0		
89	0				Dig and cart, over surface.
50	6				
1	0	4494	6		
331	0				Planking and strutting to sides of trenches, 3ft. 4in. by 5ft. 3in. deep.
6	6				Ddt. do., and add do., 3ft. 11in. wide.
56	6				Planking and strutting to trenches, 3ft. 4in. wide and 5ft. 3in. deep.
4 6	8	26	8		Ddt. do., and add 3ft. 11in. wide, and do.
4 4	8	18	8		
2 11	8	23	4		Planking and strutting to trenches, 2ft. 11in. wide, and 5ft. 3in. deep.
6	6				Ddt. do., and add 4ft 1in. wide and 5ft. 3in, deep.
2 5	6	11	0		Ddt. do., 3ft. 4in. wide, and add 5ft. 7ft. wide and 5ft. 3in. deep.
4 1	6	6	0		Planking and strutting to trenches, 3ft. 4in. wide and 5ft. 3in. deep.
2 4	7	9	2		Do., 3ft. 4in. wide and do.
2 4	0	8	0		Do., 4ft. and do.

BRICKLAYER.

ft.	in.	ft.	in.		
331	0				
	9	248	3		2½ B. in footings.
4	11				
	9	3	8		½ B., chimney breast.
2 3	6				
3	6				
	9	18	5		Brickwork in angle, chimney br east
50	6				
	9	37	11		2½ B. footings.
4 5	6				
	9	16	6		½ B.
4 2	10				
	9	8	6		½ B.
2 10	6				
	9	15	9		2 B.
4	11				
	9	3	8		1½ B., chimney breast.
16	9				
	9	12	7		2 B.
15	0				
	9	11	3		
2 5	6				
	6	5	6		1¼ B.
15	0				
	6	7	6		
16	8				
	6	8	4		1¾ B. in cement.
4 5	2				
	6	10	4		Add.
2 2	3				
	9	3	5		4 B. buttresses.
4 1	6				
	9	4	6		2½ B. in cement to piers.
2 5	2				
	9	7	9		2½ B. in cement.
2 2	11				
	9	4	5		2½ B. in cement.
85	2				
34	0	2895	8		1½ B. back wall.
2 18	0				
3	0	108	0		1½ B. extra height for gables.
1 15	0				
7	6	112	6		Add gables.
2 45	8				
33	0	3014	0		1½ B., side walls.
1 20	9				
20	0	415	0		1½ B., ddt.
2 8	3				
11	9	193	11		1½ B., ddt. for porch.
2 15	0				
21	0	630	0		1½ B., next porch.
2 44	6				
31	9	2825	9		1½ B., internal wall.
50	6				
34	6	1742	3		1½ B., front wall.
1 12	6				
6	3	78	2		Add gables.
½ 16	0				
8	0	64	0		
2 3	6				
3	6				Brickwork in angle, chimney breasts.
34	3	839	2		
2 5	3				
34	3	359	8		2½ B., walls next do.
40	0				
3	6	140	0		1½ B. wall under screens.
4 2	3				
3	6	31	6		½ B. for piers.
2 2	3				
3	6	15	9		2½ B. extra only in cement piers.
2 2	3				
34	3	154	2		2½ B., extra only in cement do.
4 2	10				
	9	4	3		Add footings.
2 10	6				
33	6	703	6		1 B. wall next classroom.
4	4				
19	3	83	5		1½ B. chimney breast.
5	6				
14	3	78	5		
4	4				
19	3	83	5		½ B. chimney breast.
5	6				
14	3	78	5		1½ B. do.
3	0				
3	0				Brickwork in angles, chimney breast, 1st floor, teachers.
14	3	128	3		
2 7	11				
14	6	229	7		3½ B. chimney stack.
3	5				
14	6	49	7		3½ B. do.
5	6				
7	0	38	6		1 B. wall, next urinal.
16	8				1 B. wall in cement, under ½ B. wall to w.c.'s.
1	0	16	8		
16	8				
7	0	116	8		½ B. wall in cement.
4 5	2				
1	0	20	8		1 B. in cement.
4 5	2				
7	0	144	8		½ B. wall in cement.
6	8				
8	0	53	4		Add extra height.
2	6				
7	0	17	6		Add next boys' lavatory.
16	9				
19	3	322	5		1 B. wall next boys' cloak-room.
15	0				
19	3	288	9		Add girls' cloak-room.
15	0				
14	0	210	0		1 B. first floor.
8	3				
14	0	115	6		Add.
2 2	7	0	28	0	Extra to brick bull-nosed angles.
2	5	6	11	0	Extra to brick rounded coping in cement to 9in. wall.
10	4	6			
7	6	337	6		½ B. deduct for recesses.
10	4	7			
	4½	17	2		Extra to axed segmental arch.
10	4	9			
	9	35	7		
10	4	7	45	10	Tuck point, 4½ soffit.
4	3				
8	0	34	0		1 B. deduct opening on landing.
4	4				
	9	3	3		Extra to neatly-axed segmenta arch.
2 4	6				
	9	6			
4	4				Centre to do., 9in. soffit.
2 4	3				Deduct fair face and twice distemper.
8	0	68	0		
20	6				Add do.
	9	15	5		
2 1	6				3 brick buttresses.
8	9	26	3		

DAMP COURSE.

ft.	in.	ft.	in.		
331	0				Damp course as described.
1	2	386	2		
4 ½ 3	6				Add.
3	6	24	6		
4	11				Add.
	4½	1	10		
50	6				Add.
1	2	58	11		
2 4 2	3				Add.
	4½	6	9		
2 10	6				Add.
	9	15	9		
4	11				Add.
1	2	5	9		

ft.	in.	ft.	in.	
	16	9		
		9	12	7 Add.
	15	0		
		9	11	3 Add.
2	5	6		
		9	8	3 Add.
	15	0		
		9	11	3 Add.
	16	8		
		9	12	6 Add.
4	5	2		
		9	15	6 Add.
2 2	1	6		
	1	2	7	0 }
2	1	9		} Add piers.
	1	9	6	2 }
2	1	8		
	2	6	8	4 }

FACING.

	85	2		Extra to Kentish Rag stone, coursed
	30	6	2597	7 random rubble facing, average 7in. thick, with proper bonders, joints neatly pointed in cement in back wall.
2	18	0		
	3	6	126	0 }
2 ½	15	0		} Add gable.
	7	6	112	6 }
2	46	6		
	28	0	2594	0 Add
2	27	0		
	2	0	108	0 Add.
2	8	0		
	9	0	144	0 Deduct do. porch.
2 2	1	2		
	6	4	29	7 Add to buttresses.
	52	10		
	32	0	1690	8 Add front.
2 ½	12	6		
	6	3	78	2 Add gable.
½	16	0		
	8	0	64	0 Add.
2 2	11	6		
	1	6	69	0 Add inside parapet.
2	8	0		
	1	6	24	0 Add.
2 2	12	0		
	1	6	72	0 Add.
2	7	0		
	13	0	182	0 }
2	15	0		} Add porches.
	16	0	480	0 }
2 2	7	11		Ex. to Kentish rag facing as before,
	15	0	475	0 for chimney.
2	2	8		
	11	0	58	8 }
	2	8		} Add.
	8	0	21	4 }
	10	6		
	15	0	157	6 Add.
2	15	0		2½ tooled Scot's York stone paving,
	7	9	232	6 bedded and jointed in mortar, and 6in. concrete bed, levelled to receive same in porch.
2 4	1	0	8	0 Circular cutting on do., to fit piers, &c.

SCREENS.

2	10	2		2in. deal, moulded both sides,
	8	0	162	8 framing, four panels high, to slide, classrooms, ground floor.
		8		8 Hatfield's patent roller sheaves on wrot. iron knees, fixed with screws and countersunk holes.
2	20	0	40	0 Iron runners, and fixing in block flooring, with screws and countersunk holes, and 4 oils.
	20	0		Iron girder, and do. for do., fixed to wood, and 4 oils.
	20	0		Do. fixed to brickwork, and 4 oils.
		6		Brass flush handles, and fixing in deal.
2	10	6		
		11		Fir wrot. all round, and framed
		6	9	8 bearer (out of baulk).
4	10	6	42	0 Fir wrot. framed and moulded out of 9in. by 4½in. moulded, 14in. girt.
	12			Mitred and returned moulded ends to do.
2	9	6	19	0 Do. as last, but plugged to wall.
	2			M. and returned moulded ends to do.
2	10	2		2in. deal moulded fixed sashes in
	6	6	132	2 small squares, with stout bars.
120		9		
	1	0	90	0 21oz. sheet glass in small squares.
2	6	6	13	0 Labour, scribing 2in. to brickwork.
	12		12	Sashes in 20 squares, s.s., and varnish one side.
2	15	3		
		10	25	5 1in. deal wrot. and twice beaded lining, and grounds plugged to wall.
2	15	3	30	6 ¾in. deal narrow splayed grounds.
2	15	3	30	6 Deal moulding, 4in. girt.
4	11	0		
	8	6	371	0 S. S. and 2cc var. on woodwork.
4	10	6		
	4	0	168	0 Add on mouldings, &c.
2	9	6		
	2	0	38	0 Add do. on do.
2	15	3		
		10	25	5 Add on lining.
2	15	3		
	6		15	3 Add on moulding.
	40	6		
	8	0	324	0 2in. deal, moulded both sides, framing four panels high, as before, to slide.
	16	0		Hatfield's patent roller sheaves, &c., as before.
2	50	0	100	0 Iron runner and fixing in wood block flooring, and 4 oils.
	50	0		Iron girder, &c., as before, and fixing to wood, and 4 oils.
2	5	0	10	0 Ddt. and add do. fixing to brickwork.
	16	9		Brass flush handles, and fixing in deal.
	41	0		
		11		Fir, wrought all round, and framed
		6	18	10 bearers (out of baulk).
2	40	0	80	0 Fir, wrought, framed, and moulded out of 9in. by 4½in. moulded, 14in. girt.
	12			Mitred and returned moulded ends to do.
	40	6		2in. deal, moulded, fixed sashes in
	6	6	263	3 small squares, with stout bar.
8 25		9		
	1	0	150	0 21oz. sheet glass, in small squares.
2	6	6	13	0 Scribing and fixing sashes to brickwork.
	16			Sashes in 25 small squares, and size, stain, and 2ce varnish O. S.
4	15	3		1in. deal wrot. and twice beaded
	19		50	10 lining, and grounds plugged to wall.
4	15	3	61	0 ¾in. deal narrow splayed grounds.
4	15	3	61	0 Deal moulding 4in. girt.
4	15	3		1in. deal wrot. and beaded casing,
	4	0	244	0 and backing to iron stanchion.
2	45	2		
	8	6	767	10 S.S. and twice varnish on framing.
2	41	0		
	4	0	328	0 Add on mouldings, &c.
2	40	0		
	2	0	160	0 Add for do.
4	15	3		
	10		50	10 Add on linings.
4	15	3		
	6		30	6 Add on mouldings.
4	15	3		
	4	0	244	0 S.S. and twice varnish on ceiling.

FOUNDATIONS AND BUILDING SITES.

THE necessity of a careful inspection of foundations in the neighbourhood of the Metropolis, and in buildings which are outside the jurisdiction of the Metropolitan Building Act, has been forcibly brought to mind by the recent summons taken out against a builder of Wimbledon for constructing three houses without providing a proper concrete foundation. The surveyor of the local board proved that the foundations consisted of mud and ashes, and there was nothing to prevent the damp from penetrating the floors. Mr. Biron, the magistrate, made a personal inspection of the foundations, which confirmed the surveyor's statement. The summons was adjourned in order to enable the defendant to comply with the Act. This case should be a note of warning to all surveyors of local boards, as well as to those who have to deal with the suburban districts round London. It is not at all unusual for any individual who takes notice of building operations and the land let on building leases to see cartloads of rubbish tipped down on land intended to be built on to make up the surrounding levels. We have repeatedly noticed the rubbish-heap both on the north and south side of the Thames as the premonitory sign of impending building operations. Unfortunately, the rubbish is of a very inferior kind, being largely made up of decaying matter, animal and vegetable refuse. Brickbats, stones, gravel, old iron, and other imperishable substances are permissible as a foundation to the soil or gravel surfaces, as they promote under-drainage; but these harder substances comprise only a very small proportion of the ingredients of rubbish-heaps in London. Generally examination will reveal more mud, dust, and ashes than anything else in those heaps. It is during the time of their formation that the inspectors should take notice of them, and prohibit the nuisance. If a by-law does not exist to enable the authorities to take cognisance of these rubbish deposits, there ought to be one. The mischief in not preventing the formation of these deposits is that in the course of a few months, or it may be years, a large and deep deposit of decaying matter, filling up some old gravel pit, has been formed, which, becoming trampled over and levelled, looks in time like the native soil. The speculative builder in due time commences to excavate his trenches in this loose, rotten, and often seething mass, and by a little manœuvring is enabled to lay his concrete upon it without going down to the proper stratum; the surveyor, or his clerk, looks at it, not taking the trouble to discover whether the excavation is really taken down to virgin soil. We may be told that By-law 1 (41 and 42 Vict., cap. 32) makes it impossible for such a foundation to pass unnoticed; but the answer is that sites so covered may be seen built on every day in the various parts of London. That by-law requires that any site filled up or covered with material "impregnated with any fæcal, animal, or vegetable matter," or with "dust or slop or any other refuse," shall be "properly removed by excavation or otherwise" before any building is erected. If this by-law is really followed, why do we see so many building sites filled up with refuse, and foundations actually made in the same? Why do contractors seek every opportunity of depositing their mud and rubbish on building sites? Again, who can say whether the whole of a deposit of this kind has been removed from a building site, supposing the by-law is put into force? These are questions which are more readily shirked than answered. The proceedings at police-courts make us every now and again painfully aware of the evasions. The opportunities for covering over or concealing foundations are far more numerous than the opportunities for inspection and detection. In the Metropolis it is very easy to get in the footings of a wall upon what is apparently a bed of concrete. A grievance of a still more pernicious kind results from the non-removal of the refuse or dust, which often remains under the ground-floors of the houses. In the south of London the soil or refuse may be seen under ground-floors that show the ease with which the by-laws are ignored. A concrete layer on the surface of 6in. is supposed to be placed over all sites, unless of gravel or natural soil. We should like to know in how many cases this rule is carried out. The recent typhoid and other cases in some parts of London call for a more stringent enforcement of by-laws relating to the sites of new and even old dwellings.

HUDSON AND KEARNS' DIARIES.

ONCE again we acknowledge the receipt of a parcel of the Registered Date-indicating Blotting-pads and Diaries, manufactured by Messrs. Hudson and Kearns, of 83, Southwark-street, which record the flight of time and enable us to meet our engagements with the least possible friction and worry. We have for some years drawn attention to their merits, and we know that increasing thousands year by year have confirmed our good opinion. To architects and builders especially their superiority to every other diary or blotting-pad made has long been manifest, and the general public are unanimous in pronouncing them—Nos. 8 and 8a particularly—the most sensible blotting-pad and diary in the market.

CHIPS.

The next Exhibition of the Royal Society of Painter-Etchers will be opened on Saturday, March 1. The election of Associates will take place on Thursday, February 6.

The new union infirmary, Dartford, is nearing completion, and is being warmed and ventilated throughout by means of Shorland's patent open fireplace Manchester stoves with descending smoke flues in the larger wards, and Shorland's patent warm air ventilating Manchester grates in the smaller wards, the same being supplied by Mr. E. H. Shorland, of Manchester.

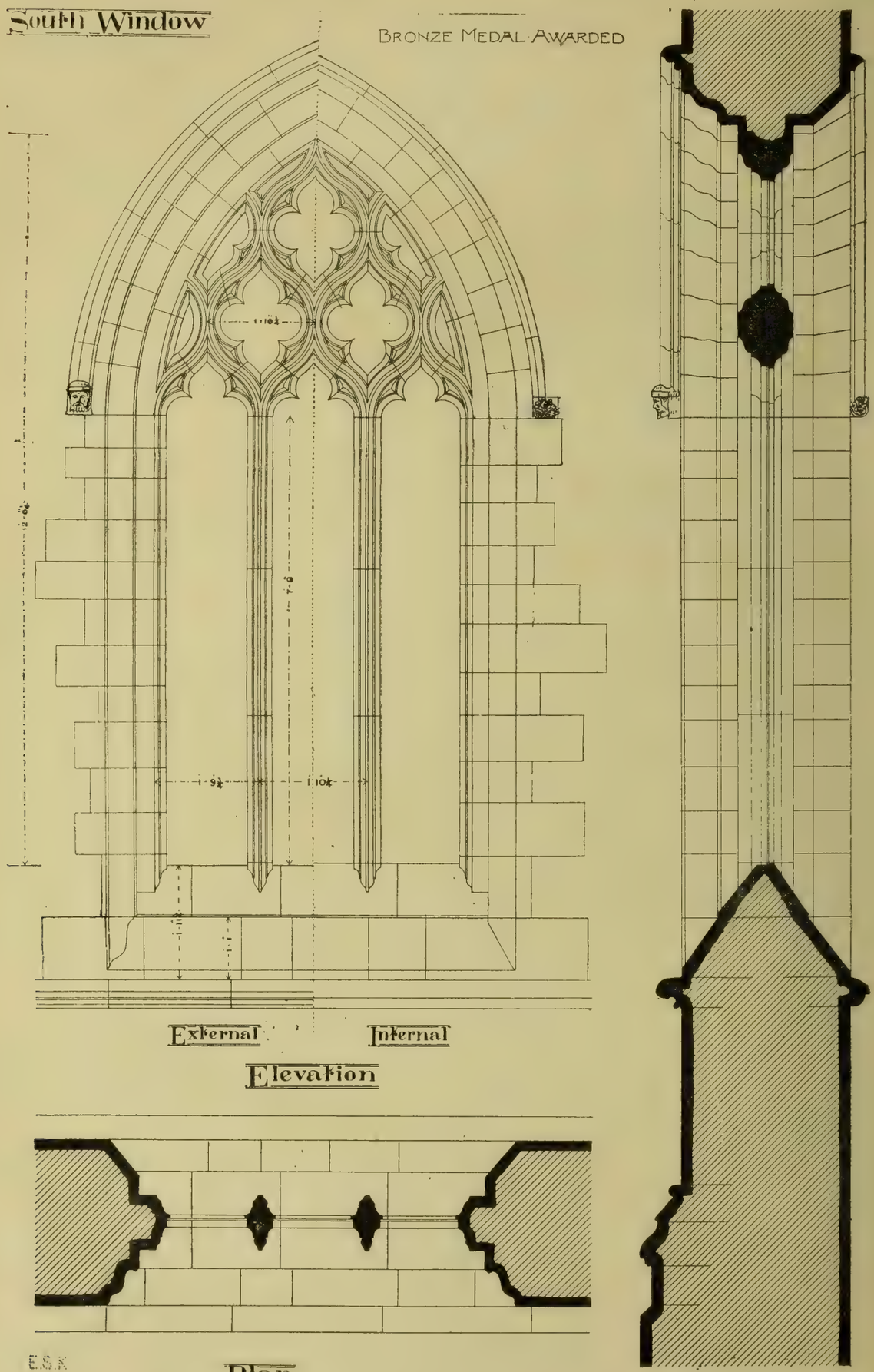
A large clock has just been started at St. Michael's Church Jubilee Tower, Teignmouth. It strikes the hours upon a large bell, shows time on four large dials, and will eventually be fitted with Cambridge chimes. The pendulum of the clock weighs 3cwt., which will indicate the size of the clock. John Smith and Sons, Midland Clock Works, Derby, carried out the work to the designs of Lord Grimthorpe.

At the close of the Spanish Exhibition Mr. Ernest A. E. Woodrow, A.R.I.B.A., the architect to the exhibition, who was also connected with the Italian and American Exhibitions, was presented by the managing director, Mr. Vincent A. Applin, with a handsome testimonial in the form of a silver cigar case, inscribed as "a token of sincere appreciation of fidelity, high ability, and untiring industry." Preparations are in active progress for the Belgian Exhibition, which is to be held at West Brompton next May.

The Chancel St. Swithuns Church Woodborough Notts.

South Window

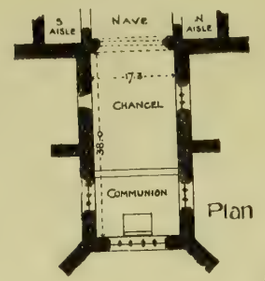
BRONZE MEDAL AWARDED



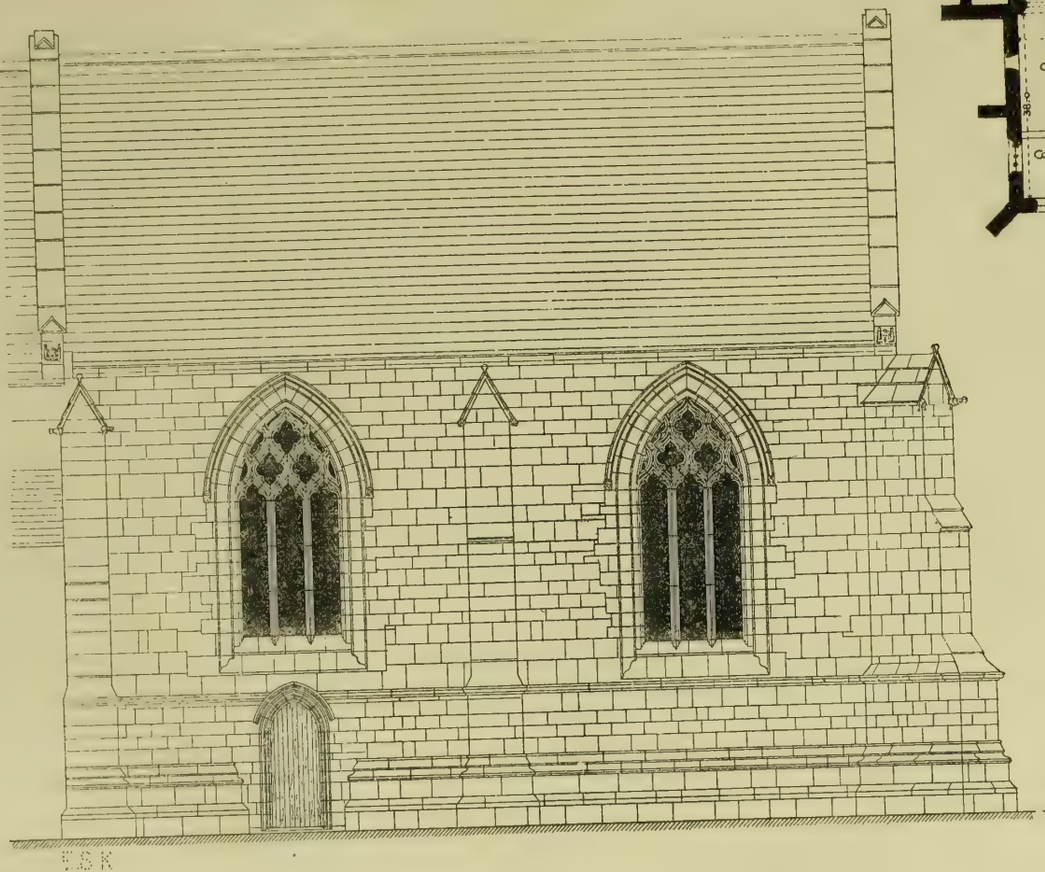
Measured and drawn by W. H. Higginbottom

The Chancel St Swithun's Church Woodborough Notts.

PROFIT MEDAL AWARDED



Plan



South Elevation

East Elevation

Note The whole of the Joints are from actual measurement

Scale

Inches 12 11 10 9 8 7 6 5 4 3 2 1 0 20 40 Feet

Measured and drawn
W.H.Higginbottom

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ILLUSTRATIONS.

THE NATIONAL MONUMENT AT BERLIN TO THE LATE EMPEROR WILLIAM I.—LODGE, LONG DITTON, SURREY.—HOUSE AT NETHERHALL GARDENS, HAMPSTEAD.—ISLINGTON CHAPEL.—LITTLE WENHAM HALL, SUFFOLK.—THE "PEACOCK GARDEN" DECORATION, DESIGNED BY WALTER CRANE.—CLOCK TOWER, MONNICKENDAM, HOLLAND.—CHANCEL OF WOODBOROUGH CHURCH.

OUR LITHOGRAPHIC ILLUSTRATIONS.

SELECTED DESIGN FOR THE NATIONAL MONUMENT TO THE EMPEROR WILLIAM I., BERLIN.

FOR description see page 857.

LODGE AT LONG DITTON HILL, NEAR SURBITON.

THIS view illustrates the entrance lodge to Woodstock, the estate of Mr. Charles L. Lavers-Smith at Long Ditton, and was erected from the design and under the superintendence of Messrs. Hammack and Lambert, architects, 59, Bishopsgate-street, E.C. The building has been executed in red brickwork, with stone dressings and half-timbered work, filled in with rough-cast, the roof being covered with ornamental Broseley tiles.

HOUSE, NETHERHALL GARDENS, HAMPSTEAD.

THIS house is situated in a commanding position in Netherhall Gardens, near Fitzjohn's-avenue, Hampstead. The elevation is carried out with red brick, with gauged red-brick dressings, the side gables being tiled with Broseley tiles, and the centre gable filled in with diaper brick squares. The entrance porch has a good appearance, and is executed with considerable taste and neatness. The large elliptic window gives light to the hall and the staircase landing, and when seen from the hall adds to the general effect. Messrs. Eastwood supplied the bricks, which were selected from sample; the stoves by Messrs. Geo. Wright; the wood chimneypieces by Messrs. Arrowsmith. The house was built at a cost of about £5,200 by Mr. H. Ellis, of Hampstead, from the designs of the architect, Mr. Wm. Hunt, 5, York-buildings, Adelphi, W.C.

ISLINGTON CHAPEL.

THE new building, which replaces the old one pulled down for the Upper-street Improvement Scheme, carried out by the Metropolitan Board of Works, stands at the corner of Church-street and Upper-street. The chapel is 50ft. wide by 66ft. long, exclusive of choir gallery, and has accommodation for about 1,000 persons. It is divided into nave and aisles by iron columns, carrying elliptic arches, the gallery front stretching from column to column. The ceilings are of plaster, divided into coffers by wooden ribs, flat over the aisles, and of an elliptic waggon form over the nave, terminating in a semi-dome. The main entrances are at the west or Upper-street end of the building, there being also a side entrance in Church-street. The staircase from this latter, together with one from the side entrance in Upper-street, gives access to the galleries and also to the schoolroom below. At the east end, behind the pulpit, is the organ and choir gallery, and underneath same, separated from the chapel by a passage, is situated the minister's vestry, the deacons' vestry being at the end of this passage with direct communication with the chapel. Underneath the chapel is the schoolroom, 50ft. wide by 56ft. long, and 15ft. high. At the west end is a raised passage-way, out of which are two classrooms, so arranged that when required the glazed framing can be raised and these rooms made part of the schoolroom. At this end of the schoolroom also are two other classrooms and the secretary's room. By means of swing divisions, which when not drawn out form a dado round the room, classes are separated from each other, and yet can all be seen by the superintendent from his desk on the platform. Behind the east end of the schoolroom are the kitchen, infants' classroom, and the church parlour, all fitted up very completely. Externally the building is faced with red bricks, the quoins and window dressings being executed in gauged work of a lighter tint, while Portland stone has been used for entrance doorways and porches, and the roof is covered with Raubon red tiles. All the main windows are of cast iron. All the woodwork throughout is of deal painted dark green, except the gallery front, which is painted white. The style adopted has been Domestic English of the 17th century, a style which, so far as the architects know, has never in recent times been employed in chapel building. Several of the classrooms and vestries are decorated by means of plaster casts of bas-reliefs, sunk in the walls with moulded frames; these are taken from works by Michael Angelo, Donatello, Luca della Robbia, Flaxman, &c. The main entrance porches are lined with buff glazed tiles with dark-green painted panelled dado, and are closed by wrought-iron gates. The font is a fixture of pavonazetto marble, with oak and forged-iron cover. The whole of the work has been designed by and carried out under the superintendence of Messrs. Bonella and Paull (late Paull and Bonella), architects, 6, Quality-court, Chancery-lane, the builders being Messrs. Patman and Fotheringham. The whole of the external and internal ironwork (except the columns in the schoolroom) has been supplied by the St. Pancras Ironwork Company. Messrs Strode and Co., of 48, Osnaburgh-street, N.W., supplied all the brass gas-fittings. Messrs. Hart, Son, Peard, and Co. supplied the ironmongery. Mr. W. J. Phillips acted as clerk of works.

LITTLE WENHAM HALL, SUFFOLK.

WE have in Little Wenham Hall a striking example of the transition between the Feudal Castle and the Baronial Hall; still the building gives the idea of being well adapted for defensive operations. It is situated 7½ miles west of Ipswich (*viâ* the Colchester-road), standing a mile and a half from the main road, and it is doubtless owing to this fact that it has so far escaped defacement. Of the date when this hall was built nothing is known but what can be inferred from the style of its architecture. In the year 1281 the manors of Great and Little Wenham were held by a family named Holbrooke, and it is probable that one of this family erected this hall. In the reign of Henry VIII. this estate of Little Wenham was the seat of the Brews, at whose hands the hall underwent some repairs, but no material alteration. The ground-floor apartments are vaulted throughout, and seem to have been used as stores, &c. There is a circular staircase running from the ground-floor to the tower. The principal access to the hall on first floor was by an external staircase, which evidently curved round the south-west angle of building, but has been removed, access now being gained by a ladder. The chapel is the greatest feature of the building, the fenestral dividing the hall and chapel, as also the piscina in chapel, being very fine. The material of the walls of this house is chiefly brick, mixed in parts with flint. The bricks are mostly of the modern Flemish shape, but there are others of different forms and sizes. The colour of the bricks varies considerably, the whole effect of the building being very picturesque, surrounded in parts by a belt of trees mantled by ivy, and, in addition, there is at a distance of 60 or 70 yards a lake of considerable area and beauty. The drawings from which the illustrations are taken were awarded a bronze medal in the last national competition at South Kensington.—GEORGE WM. BUGG.

"THE PEACOCK GARDEN" DECORATION, BY WALTER CRANE.

THE facility of design always conspicuous in the compositions of this well-known decorative artist is well illustrated in "the Peacock Garden" wall paper just produced by Messrs. Jeffrey and Co., of Islington, and of which we publish a drawing to-day. Very much of its interest and beauty necessarily is obtained by the harmonious scheme of colour adopted by the designer; but, unfortunately, we are precluded from giving more than a monochrome print of the design. Mr. Crane frequently delights in the elegance of form secured by the introduction of the peacock, often drawing the proud bird with a grace akin to the Japanese, and in this piece of work we have no less than five renderings of his favourite subject ingeniously worked in among the boldly-flowing foliage, both of the frieze as well as the all-over pattern, for the wall. The makers are to be congratulated upon the manner in which they have realised Mr. Crane's design.

CLOCK-TOWER AT MONNICKENDAM.

MONNIKENDAM is one of the most interesting of the old Dutch towns. It is situated on the shores of the Zuyder Zee, some eight miles north of Amsterdam, and was formerly a town of some importance. But now its trade has almost all gone. One of the principal buildings in the town is the 16th-century clock-tower, which is built of red brick, with stone dressings and strings. The angles have stone quoins placed at intervals, with courses of brick between each. The jambs and arches of the windows are also built of brick and stone, arranged in the same manner. Above the stone parapet rises an octagonal slated belfry, surmounted by a bulb with open ribs covered with lead; the bells, as is usual in Holland, being hung on the outside. The building in the foreground of our illustration is the cheese market, also of red brick and stone, which, with the old houses adjoining, helps to make up a most picturesque group. Our illustration is from a drawing by Mr. A. E. Perkins, exhibited this year at the Royal Academy.

THE CHANCEL, ST. SWITHIN'S CHURCH, WOODBOROUGH, NOTTS.

THIS building is a good example of 14th-century work. The east window is exceptionally fine, both in design and detail; it was originally filled with stained glass, but now only a few vestiges remain. The windows in the sides are not so worthy of mention, but still are good examples. The opening in the east gable is filled with good tracery, and surmounts two shields. The terminals on the gables appear to have been elaborately carved, but are past recognition. The sedilia in the south wall is well worthy of mention. The floor of this chancel is 3in. lower than the nave floor, the step at the chancel arch being down. I made these measured drawings for the Dutton Walker Art Scholarship, £25, awarded to me at the Nottingham School of Art. This prize I gained by a design for a church, and the conditions required that a measured drawing of a good example of existing work should be made and approved by the committee before paying the money. I selected this building because it struck me as being a good example, worthy of notice, which I am not aware it has previously received.—W. H. HIGGINBOTTOM.

Sir Wilfrid Lawson on Tuesday week unveiled a bust of the late Mrs. George Moore, which has been placed in the George Moore Memorial Hall, Mealsgate, near Carlisle, by local subscription. The memorial is a copy by Mr. Adams-Acton, the well-known sculptor, of a bust which he chiselled in 1861, when Mrs. Moore gave him sittings in Rome. She was then on her honeymoon.

The niches in the south side of the Louvre and Tuileries, facing the Rue de Rivoli, from the Pavillon de Rohan to the Rue des Tuileries, forty-six in number, are to be filled with statues of celebrities of France, including those of Jeanne d'Arc, Mesdames de Sévigné and de Staël, and Carnot, Bouchardon, Kléber, Hoche, Desaix, Ney, Soult, &c.

Mr. W. G. Shrubsole, a well-known painter of Welsh scenery, died on Thursday evening, the 12th inst., at Manchester, aged 32 years. He was a native of Maidstone, and was articled to Mr. Hibbert Bensted, architect, of that town. On the completion of his pupilage he obtained an appointment at Bangor, and while there applied himself to the pourtrayal of those Welsh scenes in which he achieved an early and rapid success. He possessed a good mastery of mountain form, a keen sense of colour, and a fine feeling for atmosphere. He leaves a widow and three children.

WAYSIDE NOTES.

YOUR last issue was a regular benefit for competing architects. Three good competition advertisements all at once are encouraging to a degree, and they will cause many drawing-offices to wear an unusually busy aspect when their respective staffs have recovered from the Christmas festivities. And they *are* three thoroughly good competitions—such, indeed, as should go far to recompense for the undeniably bad ones. Really, I believe that, in spite of all, the architectural competition is rapidly improving. There have for some time past been evidenced earnest endeavours on the part of promoters to wrestle with the problems that have done so much to render these competitive struggles a mere lottery at the best, and at the worst a shameful example of jobbery. Now, we see on all sides honest efforts to purify and exalt. One great improvement is the invariable appointment of assessors whenever a competition of any importance is arranged. Compared with what we were accustomed to a few years back, the management of affairs of this nature at the present time is perfection. Rarely do we now find that the assessor is passed over as an individual whose services are not only absolutely unnecessary, but a positive evil. If he be not always actually named, as in the advertisement of the Victoria Institute, Worcester, competition, we are yet promised that he shall be in due course appointed, as in the advertisement of the Harrogate Corporation. If things go on improving at this rate, the day may yet dawn when the retention of the services of a professional referee shall be a *sine qud non*, and other matters perfected in time with this, till competition fiascoes will be things of the past—mere nightmare memories of phantom Liverpool cathedrals, and shadowy or *shady* Richmond vestry-halls.

Another great—a very great—improvement to be noticed as having become evident of late, is the more frequent employment of the dual system. It is gratifying to note that both in the Worcester and Harrogate competitions, this method has been adopted. The amount of labour, worry, anxiety, and envyings and heart-burnings that the dual system of competing saves the architectural profession is incalculable. I am glad above all things that this dual method is now so frequently adopted, and fervently hope that it will continue to grow in the favour of Corporations, Committees, and others who have the arranging of our competitions.

Of course the South Stockton public offices won't receive the attention that is destined to be paid to the Harrogate and Worcester competitions. The corporations of these latter towns may be prepared to meet a perfect inundation of designs, even as did the municipal fathers of Sheffield. All the architectural world feels tempted to "have a smack" at a competition golden with premium money, such as these of Worcester and Harrogate. The careful retailer selects them as genuine opportunities, and the wholesale and exporting gentlemen duly send off their ill-digested schemes, which, as they proudly tell their friends and relations, only took them so many hours and minutes to prepare. It is surprising what a mass of this stuff—coarse, hasty draughtsmanship and design—a dual competition will call forth, to the benefit, chiefly, of the railway companies and others to whom the carriage thereof is consigned, and to the stimulation of the trade in stretchers and other requisites of the competing architect. They don't certainly trouble the assessor much, a passing glance sufficing to show him the worth of the exhibits; but it is no joke for the poor borough surveyor and his assistant, upon whom generally devolves the thankless task of returning them to their owners, who, with the same admirable suavity with which they packed them off, mechanically receive them, with the remark that, as they only expended so many hours so many minutes on the preparation of the drawings, they didn't expect any other result!

The steel-plate engraver will, excepting for the gentlemen who prepare bank-note plates, and the like, soon be extinct in the land; and wood-engravers are starving. Meanwhile pen-and-ink draughtsmen are flourishing like the bay tree, wheresoever they may be found to have even deserved public esteem, and embraced and held fast to the opportunities occasioned by the marvellous development of "process" or mechanical reproduction for original black-and-white drawings. In the case of some, this success seems to have placed the exponents of the art on the pinnacle of conceit. The author of the really splendid work on pen draughtsmanship, apparently, does not seem to recognise the fact that there are various styles of pen-drawing practised by architects with different ends in view. We should be very sorry to always have architecture *à la* Pennell, as we should soon become nauseated of the same, even if it evidenced more knowledge of architectural detail. Indeed, in this particular style of drawing, Mr. Herbert Railton has remained head-and-shoulders above everyone. As to other styles of architectural draughtsmanship, before we give sweeping criticisms we should have regard to the fact that drawings of architecture are destined for many and varied ends. Those at which Mr. Pennell may think fit to sneer may yet be admirably adapted for their particular purposes. If it is desired to exhibit to architects the exact nature of the details of a design, it must frequently be done in a hard and precise manner, the slap-dash system, however artistic, being wholly useless for the purpose in hand. Whereas the popular artist has merely to please and captivate the imagination, the architect, drawing for the architect, has to elucidate certain qualities of architecture that are dead letters to an artist who has not, like Mr. Railton, been through years of technical training in an architect's office. The difference between Mr. Railton's work and that of other artists who essay to delineate architecture, remains in the fact that whereas the latter scarcely know the details of one style from another, to the former every moulding is as full of meaning and significance as it is to the accomplished architect. And no popular artist, not practically acquainted with architecture, both as a science and an art, can ever hope to draw like, say, Mr. Reginald T. Blomfield, Mr. Arnold B. Mitchell, Mr. Roland W. Paul, Mr. E. Guy Dawber, and other architects, of whose draughtsmanship the present generation may well be proud.

The subject of drawing is one of those that form ever-welcome topics for architects, and particularly for architectural students. So long as it be treated enthusiastically and with some degree of power and originality, it never fails to prove a popular subject-matter for lectures. Mr. Reginald T. Blomfield having attained high proficiency as a draughtsman, particularly with the lead-pencil, any hints and suggestions come from him with more than usual weight, and, therefore, the members of the Association present last Friday at No. 9, took their benefit in the matter of information as to architectural drawing. Yet so interesting is the subject of drawing, that if the next paper at the Association were also on drawing, the meeting would be as ready as ever to listen to a further elucidation and commentary on draughtsmanship. I suppose that this is to be accounted for by the fact that *individuality* is the chiefest charm in drawing, be it architectural or otherwise. We are all greatly interested in the methods of working of each and every renowned draughtsman, which are the causes of the characteristic effects to be noted in his work. Happily, the present fashionable method of reproducing black-and-white drawings tends towards the development of individuality in artist's work; for, with a free pen on a smooth sheet of Bristol-board, the expression of one's ideas is wholly unconstrained, and in the reproduction we have every touch of the draughtsman in mathematical facsimile, where the old hand-engraving processes frequently negative any individual characteristics of the artist, and exalt those of the engraver.

Registration for architects is being considered with increased seriousness in America, as in other quarters of the globe. From a note in a recent issue of the *American Architect*, I learn that an effort is being made in New York to induce the Legislature to pass a law this winter rendering compulsory the licensing of architects by the State, after examination by a competent board of professional men. According to the writer of this note, those in the profession—"now in practice"—are to be simply registered, while those who, after the passing of the proposed Act, attempt to enter the profession will have to submit to an examination. The *American Architect* doubts whether the measure will pass, though expressing an opinion that, if it does, "it will be a great benefit to the profession, and also to the country." With our experience to go upon, I should say that the doubts are well founded, but that should not for a moment lessen the efforts of those engaged in fathering the scheme, since, although they may be nearly certain of failure at the first attempt, continued endeavours must ultimately be crowned with success in America as in this country. Indeed, there are many reasons why it should be infinitely easier to pass a measure of this kind through the New York State Legislature than through our Houses of Parliament. Here we are evermore wedded to old traditions, and have an insular antipathy to interfere with institutions as at present existing, while no such obstacles obstruct the road of improvement in America. As to the necessity of the measure, it is needful enough, in all conscience, in this country; but it must be far more desirable, on the other side of the Atlantic, to put some barrier against incompetency. For to the land of the setting sun migrate many ne'er-do-wells of the Old World, and besides their own black sheep, it must be very necessary for educated and skilled American architects to protect themselves from the malefactions of outsiders.

By the note in the *American Architect* I am led to the belief that, besides the State of New York, some dozen other States are considering the question of the Registration of Architects. If this be so, it is a striking instance of the spread of the agitation for closing the ranks of the profession against incompetency, and should prove an encouraging piece of information to those among us who have employed their own time in working for the success of the Registration movement in our own country. Doubtless, if one of the American States passes a law to the desired effect, the hesitating ones will immediately follow suit, and the remaining States will have the question forced upon them from outside. I, therefore, offer my sympathies to the gentlemen engaged in promoting the cause of Registration in New York, and trust that, if not at first successful, they will "keep on pegging away."

A CHRISTMAS CARD.

To my good friends I greeting send,
With hopes for all, in every station,
That they a Merry Yule may spend,
And not forget our Registration!

GOTH.

CHIPS.

The Bolton school board discussed at their last meeting what commission should be given for quantities to the architects of the proposed schools in Chalfont-street and Brownlow Fold. By a majority of seven votes to six, it was decided that the payment for quantities be 1½ per cent. in addition to the customary 5 per cent. for plans and supervision.

The dedication of a new mission chapel at Byard's Leap, Fulbeck, by the Bishop of Lincoln, took place on the 3rd inst. The chapel had been built under the superintendence of the rector, Mr. W. Cragg, of Caythorpe, being the contractor for the brick and slatework, Mr. J. Farmer for the woodwork, and Mr. J. Kelly, of Leadenham, the glazing. The building is of white and red bricks, 40ft. long by 15ft. wide, and 10ft. to the wall-plates.

The fine rood-screen in St. Andrew's Church, Kenn, near Powderham Castle, has been restored by Messrs. Harry Hems and Sons, of Exeter, at a cost of £600.

A public clock-tower and drinking-fountain erected at the junction of New-road and Above Bar-street, Southampton, was unveiled on Monday week. It has been erected from plans by Mr. Sydney R. Pope, M.S.A., of Southampton, which were chosen in competition, by Messrs. Garrett and Hayson. The style is Early Decorated, and the structure is built of stone, rising to a height of 45ft.

The almshouses known as Palmer's Hospital Charity at Bridgenorth, and founded in 1687, are being rebuilt at a cost of £1,200, and from plans by Mr. W. Wood Bethell, of Westminster. The women's quarters were reopened last week. The new buildings are of half-timbered work, standing on a base of red Alveley stone, and a wide common staircase opening on to a verandah leads to the rooms on the first floor. Each inmate has a separate bedroom and sitting-room.

Dr. Kaye, of Birmingham, has been elected medical officer of health for Huddersfield.



PAUL PFANN.



WILHELM RETTIG.

SELECTED DESIGN FOR THE NATIONAL MONUMENT TO THE EMPEROR WILLIAM I., BERLIN.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATION.]

In the great German competition open to all painters, sculptors, and architects for a monumental scheme worthy of the nation in memory of the late Emperor William I., the architects of Berlin have come off victorious, and the two first prizes have been awarded in their favour. No event in the art world of Germany has ever created such a stir as this contest, and no more ideal project has been inaugurated since Mediæval times; indeed the enthusiasm expressed on all hands concerning the memorial may be taken as an evidence of the wide-spread interest evinced in the undertaking. No limit seems to have been fixed as to the exact form the monument was to take, neither any sum stipulated as to its probable cost. Seven sites in the city were named and the memorial was to be adapted to one of them, but its precise character was left entirely to the judgment of the competitors. The jury, consisting of fourteen persons of note, comprised seven professionals, two of whom were architects, and seven laymen. The prizes offered were £500 and £250. It was understood that one great feature required in the designs submitted was that the many victories of the great Kaiser were to be represented as well as the Unification of the Empire. The project was not to include a place of sepulchre, and naturally the structure was to be grander and more imposing than the memorial built to Victor Emmanuel, for "the whole nation feels that an artistic expression is needed of an epoch which shall express to our children's children, like a hallowed legend, the glories of its heroic and venerable king." The realisation of this darling project remains a work of the future; but the result of the competition has been unanimously accepted, and steps will soon be taken, we understand, for carrying out the chosen design. The plans submitted were of the most varied description, and works of all kinds were sent in. All were under motto. Some persons of influence expressed regret that no recognition was made either of Herr Eberlein (who is steadily advancing as a foremost sculptor) or of Herr Kaffsack, who, in conjunction with Herr Rièth, the architect, designed the Schloss Freiheit, a creditable work of some importance, consisting of a row of houses opposite the principal gate of the Palace. Not a few of the competitors proposed to pull down whole streets in the vicinity of the Palace, to afford space for the memorial; but the important buildings round the Palace, to say nothing of the two canals close by, rendered such a scheme very difficult of adoption. Numerous sites were suggested within the park on both sides of the Brandenburger Thor, the great gate at the west end of the main thoroughfare known as Unter den Linden. The busy traffic at this point rendered all the schemes impracticable, even when the expense of removing adjoining property did not do so. Of all the sites most favoured and less likely to present objections of a serious kind was the Königs Platz, from whence the New Imperial Parliament buildings can be seen down the Lieges Allée. Here the great Pantheon-like building by Herrn Rettig and Pfann is proposed to be built. By the courtesy of these gentlemen we are enabled to present our readers to-day with a double-page sheet of illustrations of their chosen design, giving a plan, general elevation, longitudinal section, exterior view, and an internal sketch showing the equestrian statue of the Emperor. The solution of the National Monument question thus presented has been described as the most imaginative, as well as artistically mature, besides being the grandest conception of the whole submitted designs. It takes the character of a national shrine, whose "very magnitude should suggest a mighty thought"; and in order that it might be seen from a distance, the authors say they chose the site on the Königs Platz. They were aware that no plastic work could be cast on a sufficiently magnificent scale to answer this purpose or realise a monument of the first order. They therefore designed a vast dome-crowned building in granite and bronze for the reception of the majestic statue of the Imperial ruler, leaving the more pliant sister arts to relate on walls and ceiling the story of the old and new Germanic States. The main building is to be circular, of about 120ft. diameter, surmounted by a double dome, the outer one being lightened by perforations in sculptured coffers, through the openings of which the daylight may come in and throw effulgence on the statue in the midst, as represented by the interior perspective. The central area is to be lower than the main floor or gallery round at the upper portico level, and by these means the designers have been enabled to group two ranges of statues. Those in the crypt-like hall represent the rulers of the Old Empire, while above, under the main arcade, are the princes of United Germany. Further space is provided for embellishment in future by the erection of additional monuments and statues. In front of the great circular hall, and facing the great column of Victory, is a vast colonnade extending right and left, about 200ft. each way, on either side of the great triumphal arch leading to the hall. The pavilions at the ends are crowned by small domes. Here statues of various statesmen and generals associated with the Empire are to be placed. Behind is another cloister raised on a platform some 20ft. high, affording further space for the development of the same idea—"in everlasting memory of loyal co-operation of people and ruler in achieving a common victory." The judges have clearly stated their determination as to the suitability of the chosen design, and they adhere to the site thus selected as the best. A feeling is expressed, naturally enough, that eminent artists will be employed to participate in the execution of such a colossal work. The circumstance is also said to be pregnant with bright hopes for the future of German art—that in this great competition the palm was carried off precisely by young artists, hitherto comparatively unknown to fame. The Communal Council of Berlin on Thursday in last week adopted a proposal of the Municipality to authorise the demolition of the Schloss Freiheit, with a view to the erection on the site of the monument. We give the portraits sent us from Berlin, with a few biographical notes concerning the fortunate winners of the prize. Herr Wilhelm Rettig was born at Heidelberg in 1845, and studied architecture in Karlsruhe, where, at the age of 23, he passed his examination in Construction and Design. After this he was engaged as assistant to the distinguished Professor Adolf Schröder, who proposed him as his successor. Later he removed to Berlin, entering the office of Herrn Ende and Böckmann, the architects to the Crown. He took part in the Hamburg Town Hall competition (won by Sir Gilbert Scott), and his design, though unsuccessful, was highly spoken of. As first architect of the office of Herrn Gropius and Schmilden, Herr Rettig again distinguished himself, through the brilliant result achieved by this firm in the competition for the plan of the new Cloth-market at Leipzig. When intrusted with the Rudersport he was much occupied with the technical problems of the building of race-boats, and erected a structure of the kind before the Stralau Gate in Berlin, which soon acquired widespread celebrity in sporting circles. He gave up his post in connection with this work, and accepted a position of some advantage associated with the building of the Imperial Houses of Parliament. His experience thus gained as an assistant under the Imperial Architect, Herr Wallot, and his fortunate connection with his friend and partner, Herr Paul Pfann, enabled him to carry out his grand design for the National Monument. Herr Paul Pfann, who, we are told, is to be credited with the ornamental and allegorical elements in the present composition, was born at Nüremberg in 1860, and was a pupil in the Technical High School at Munich. He served his time with Prof. Friedrich Thiersch, of the same place. In 1886 he removed to Leipsig, and in 1887 joined Herr Rettig in Herr Wallot's office at Berlin. Both then and since he has taken an honourable part in various competitions with more or less success; but his chief talent is displayed in the picturesque part and decorative side of an architect's practice. The second prize design, which we hope shortly to publish, was by Herr Bruno Schmitz, of Berlin.

ARCHITECTS' REGISTRATION IN THE UNITED STATES.

We are glad to see that the principle of compulsory registration for architects is being adopted by the profession in America, and that Bills to give the proposal legal effect are likely to be brought forward in several States' legislatures. The *American Architect*, in its last issue to hand, remarks:—

"An attempt is to be made to induce the Legislature of New York to pass this winter a law providing for the licensing of architects in that State, after examination by

a competent professional board. The Bill offered provides that architects now in practice shall be simply registered, but that all future applicants for a place in the profession shall pass the examination and be licensed by the Board, under penalty of a heavy fine for engaging in professional work without the license required. A small license-fee is demanded, which goes towards paying the expenses of the Examining Board. We suppose that there is not much probability of the passage of this or any other Bill to prevent free-born citizens from piling up bricks or stone in any form they see fit, notwithstanding the obvious utility of such a law; but patience and perseverance will undoubtedly, in time, bring about a change in public feeling. Meanwhile, it is worth remembering that Legislatures are very much influenced by what is done by the Legislatures of other States, and that the public interest in such a Bill, and, in consequence, the probability of getting it passed in any State, would be much increased by having similar measures simultaneously pressed in as many other States as possible. To the legislative mind, the fact that a dozen other States were considering such a Bill would give it tenfold the importance that it would claim on its own merits, and it would be strange if the Legislature of one of the States did not finally pass it, for the sake of surprising the other Legislatures, if for no better reason. At the same time with this, it seems to us that good might be done by proposing to Congress to establish, by means of examinations open to professional men of good repute, and under the charge of persons in whom the profession would have full confidence, a grade of Government architects, to whom, exclusively, such public work should be entrusted as it might seem best to assign to private individuals. We do not think it impossible, in the present state of feeling in Congress, that such a measure might be passed at once; and it would not only set a good example to States, but would itself be a great benefit to the profession and the country. While the rank of Government architect, like the similar one in France, need not imply that its possessor would ever have any public commissions, the fact that he had been adjudged worthy to receive them would have an important effect on his private practice; and, on the side of the Government, the formation of such a class of professional men would greatly encourage the placing of public buildings in the hands of local architects belonging to the class, by removing the fear which now exists, and is not without foundation, that the throwing open of the public architectural service to the whole profession, which at present includes, so far as the public can tell, everyone who has been three months to an evening class in mechanical drawing, may lead to blunders and malpractice of various sorts."

CHIPS.

The time for the delivery of plans in the police-buildings competition at South Shields has been extended to the 15th March next.

A special meeting of the Rhyl Commissioners was held on Monday to consider a report by Mr. Scoones on projected improvements. It was decided to adopt Section 1 for the present, which includes the construction of a new esplanade between the present promenade and the sea, at a cost of £10,000; the purchase of the pier for £6,000, if it can be secured; and that Mr. Scoones be asked for plans.

The public inquiry into the Glasgow mill catastrophe will be opened in the New Municipal Buildings to-day (Friday), the Commission being composed of Colonel Malcolm, C.B., R.E., commanding the Royal Engineers in Scotland, and Mr. W. Wybrow Robertson, Surveyor in Scotland of Her Majesty's Office of Works.

A memorial tablet to Sir Henry Sumner Maine was unveiled in Westminster Abbey on Tuesday afternoon by Viscount Cross. The tablet, which is placed in the west aisle of the north transept, bears a sculptured portrait of Sir Henry Maine, surrounded by an inscription. The memorial is the work of Sir Edgar Boehm, R.A.

Mr. Alexander Frew, C.E., delivered a lecture to the members of the Architectural Section of the Glasgow Philosophical Society, on Monday night, on the subject of the disposal of sewage. He proposed that the sewage of Glasgow and its suburbs, and also of the towns in the valley of the Cart, and on the Clyde as far down as Bowling, should be taken to Dalmuir and treated by some chemical processes, and that the sludge, along with the Clyde dredgings, should be disposed of in making up the waste lands in the estuary of the Clyde.

The Alexandra Arcade at Swansea, which unites the High-street with Alexandra-road, has just been completed. The architect is Mr. E. Bath, of Swansea, and the builder Mr. Henry Billings, Swansea. It provides 27 shops, and is furnished with an installation of electric light. Its principal novelty, among South Wales arcades, is the principle which has been adopted of building a second story of shops above the first, and giving access to the upper row by galleries or balconies, which lead all along the building. The public go up massive stone flights of steps at either end, and pass along a pavement in front of all the shops. The arcade is traversed by bridges at either end and at the centre.

A new secondary school is to be erected at Broughty Ferry to contain 600, with science departments and gymnasium fully equipped. Messrs. James Maclaren and Son, Dundee, are the architects. The Bell-Baxter Governors, Cupar, Fife, have adopted the plans for the extension of the present buildings prepared by the above firm, and work is to be commenced forthwith.

Building Intelligence.

Bournemouth.—The new church in Surrey-road, known as St. John the Evangelist, was consecrated last week by the Bishop of Salisbury. The church stands just within Dorsetshire, being a stone's throw from the county boundary line. The church is built in the Early Decorated style, and at present provides accommodation for 260 persons. When the plans are completed there will be sitting accommodation for about 800 people. The architect was Mr. Tom Stevens, Richmond Chambers, Bournemouth, and the contractors Messrs. Hoare and Sons, of the same town. The nave and the north and south aisles were only contracted for, the completion of the nave and the addition of transepts, chancel, organ chamber, north and south vestries for the clergy and choir respectively, being deferred until the growth of the population renders their erection necessary. When the nave is completed its length will be 70ft. and its breadth 24ft.; the height of the nave from floor to ridge is 45ft., and from floor to eaves 30ft. The transepts will measure 21ft. 6in. by 15ft., and the chancel 30ft. by 24ft. The width of the aisles is 12ft. The flooring of the main portions of the church consists of wood-block paving, while the passages are paved with red tiles. When the plans are completely carried out there will be a tower rising to a height of 73ft., to be surmounted with a broach spire of freestone, the complete height being 140ft.

Bishopstoke.—The first block of buildings commenced at Bishopstoke a few months ago by Messrs. Lovatt and Co., of Wolverhampton, contractors to the London and South-Western Railway company, as a carriage and waggon-repairing depot, is now nearly completed, and will shortly be out of the builders' hands. The directors have under consideration tenders for erecting the second block, and the order is expected to be in the hands of the contractors shortly, in which case the work will probably commence with the New Year. The second block will comprise smiths' and fitters' shops, and when completed, will, with the block now nearly completed, form a plant for all kinds of repairs to carriages and waggons. The north girder of the new bridge was successfully placed into position on Sunday last. The contractors, Messrs Shaw and Co., have the work well in hand, and the new bridge will be opened early in the New Year. The term of Messrs. Mowlem and Company's contract with the London and South-Western Railway Company shortly expires. They have been successful in renewing it for another three years.

Fenton.—The formal opening of a suite of public buildings which have been erected by Mr. W. M. Baker, of Hasfield Court, Gloucestershire, and leased to the Local Board, were opened on the 11th inst. This improved accommodation will admit of the old public offices being utilised as a school of art. The public buildings form an imposing block, standing back some 168ft. from the east side of Church-street, and flanked on either side by new streets called Baker-street and Gimson-street, with the church to the south. The space in front of the buildings forms an open square. The buildings comprise a central block, containing a court-room, with magistrates' private room, board and committee rooms, clerk's and surveyor's offices; while over these is an assembly-room, 84ft. long and 42ft. wide. To the right of the central block is a wing in which there are a reserve-seat entrance and staircase, ticket-office, and cloak-room, and over these a committee-room and ladies' cloak-room. To the left of the central block is another wing, in which are the side entrance, public lavatory, rate-collector's office, and staircase up to green-rooms, which occupy the floor above, and communicate with the stage end of the assembly-room. Externally the buildings are constructed principally of brick, with stone freely used as dressings. The architects were Messrs. R. Scrivener and Sons, of Hanley. The contract has involved an expenditure of over £6,000. The builder was Mr. W. Collis, of Longton; the heating apparatus is by Messrs. Bacon and Co., of London; and the gas fittings are by Messrs. Winfield and Co., of Birmingham.

Jarrow-on-Tyne.—A large block of business premises have just been erected for Messrs. Johnson and Armstrong, consisting of three shops, with show room, work room, and offices, &c., over. One of the shops has been specially fitted up for a butcher's shop, and lined out with Minton's tiles and marble. The window sashes are of mahogany, strengthened with iron, and are made to slide out of sight behind the fan-lights above. The bench is of marble upon a granite base. Special tramways are fitted up for easily running the meat to any part of the premises. The building is of red Normandy bricks, with Denwick stone dressings, and is Renaissance in character. The whole of the work has been carried out from the designs and under the superintendence of Mr. J. Walter Hanson, architect, of South Shields and Jarrow, Mr. Hugh Shields being the clerk of works, and Messrs. Jas. Storar and Son the contractors.

COMPETITIONS.

Freckleton.—At the monthly meeting of the Fylde rural sanitary authority, held at Kirkham on the 11th inst., it was resolved to adopt the scheme of sewerage for the dictrict of Freckleton, submitted by Mr. William Wrennall, C.E., of Liverpool. This scheme was selected in an open competition under motto, and was awarded the first premium. Mr. H. B. Nicholl, C.E., of Birmingham, obtained the second premium, and Messrs. Brierley and Holt, engineers, of Blackburn, the third.

CHIPS.

New Wesleyan Sunday schools at Dobwalls, Cornwall, were opened on Tuesday week. The chief room is 40ft. by 20ft., and there are also four class-rooms. Mr. Wonnacott, of Falmouth, is the architect, and Mr. S. Trehearn, of Liskeard, the builder.

The interior of the old parish church of Abergwili, near Carmarthen, has recently been very greatly improved by the presentation of a memorial window for the east end of chancel. This work has been designed and executed by Messrs. Heaton, Butler, and Bayne, London, at a cost of nearly £200. The subjects represented in the three divisions are the Transfiguration, the Baptism of Christ, the Crucifixion, the Burial of Our Lord, the Ascension, and Our Saviour's appearance to Mary Magdalen. Above this large window is a small circular window, in which our Lord is portrayed seated in glory. The chancel has, at the same time, been thoroughly restored and beautified by the Bishop of St. David's, £300 having been expended on this part of the work by his lordship himself. The architect was Mr. Ewan Christian.

A deputation waited on the Charity Commissioners on Monday to petition for a contribution towards the purchase of 52 acres of land for the extension of Peckham Rye common. The freeholders are prepared to part with the land at £1,000 per acre, and the total cost of the scheme, including all charges, will amount to £60,000. If the present opportunity is not embraced the land will be sold for building purposes. As it was found that there was an error in the plans submitted, Mr. Anstie, on behalf of the Commissioners, asked for corrected plans before reporting upon the scheme; and it was arranged that such plans should be prepared and sent in forthwith.

After undergoing restoration at a cost of about £1,300, the parish church of All Saints, at Ashcott, was reopened for Divine service on Wednesday week, the Bishop of Bath and Wells officiating. The restoration has been carried out by Messrs. Merrick and Son, of Glastonbury, from plans prepared by Mr. E. J. Dampier, of Colchester. The church will now accommodate about 300 persons. The north and west galleries have been removed from the old church, and the chancel has been almost entirely rebuilt, whilst a new organ-chamber and a vestry have been added. The church has been entirely reseated, the handsome old bench-ends being retained.

At the last meeting of the Bristol Society of Architects, held at the Fine Arts Academy in that city, Mr. Henry Crisp, president, in the chair, a paper entitled "Experiences of Architectural Education in Bristol," was read by Mr. T. S. Pope, and was followed by a discussion.

The annual *soirée* and concert of the Edinburgh and Leith branches of the Amalgamated Society of Carpenters and Joiners was held on Friday night in the Waverley Hall, Waterloo-place, in that city, Councillor J. C. Dunlop in the chair. There was a large attendance.

A new public hall was opened at Tarvin, Cheshire, on Tuesday week. Mr. Wynne, of Manchester, was the architect, and Messrs. George Wright and Sons, of Kelsall, were the contractors. The main hall, with a gallery, accommodates 700 people, and a reading-room, two committee-rooms, and other apartments are also provided.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.—On Tuesday, December 17, at a well-attended meeting of the Birmingham Architectural Association, a paper entitled "Towers and Steeples" was read by Mr. A. B. Mitchell, A.R.I.B.A., in which he gave a masterly analysis of the history of the varied forms of towers and spires. The subject was dealt with in a very comprehensive and complete manner, and was illustrated by a number of excellent drawings of English and Continental examples. Mr. Mitchell, in closing his paper, deduced from the examples he had quoted the principles which seem essential to the designing of towers, drawing special attention to the means by which an effect of equal richness was attained throughout the height, and to the manner in which the difficulties of the connection of tower to spire were overcome by the Mediæval builders. The meeting closed with a hearty vote of thanks to Mr. Mitchell, moved by Mr. T. Naden (president), and supported by Messrs. Doubleday, Henman, Newton, and Bidlake.

DUNDEE INSTITUTE OF ARCHITECTURE, SCIENCE, AND ART.—The first ordinary meeting of the present session of this institute was held in the large hall of the Y.M.C.A. at Dundee on the 12th inst. Mr. T. S. Robertson presided. Mr. J. E. White, LL.D., delivered a lecture on the "Tanagra Terracottas and their Place in Greek Art." On the platform were shown a large number of statuettes, consisting of some original Tanagra terracottas, and many reproductions—in the sizes and as near as possible the tints of the originals. The lecturer said that when the Tanagra statuettes were found in 1872, it was seen that they had a very marked superiority and point of difference as compared with any of the other terracottas all over the Greek colonies. Many of them came to light not only with forms of colour, but with colour as it was put upon them by the Greeks, giving them an illustration of what the Greeks meant, and how they treated sculpture in regard to colour. They were beautiful in point of form, the feature that distinguished them in comparison with other statuettes being the singular sense of modern life which they conveyed, and the new flood of light which they cast on inner Greek life. We always associated the Greeks with dark hair, but this was obviously a mistake, because in Asia Minor and everywhere he knew it was a chestnut yellow. They found that the Greek ladies had three or four methods of dressing their hair in old times, and it was a mistake, as was generally done, to suppose that the dress was the same all over. It consisted of two distinct parts, and out of their small materials the Greek ladies could evidently give as great variety of dress as could be secured in London or Paris. The speaker's comments and comparisons were illustrated by a series of limelight views.

EDINBURGH ARCHITECTURAL ASSOCIATION.—At the fortnightly meeting of this association, held on the 12th inst., Mr. G. S. Aitken gave a lecture on "By-paths in Architecture." Professor Baldwin Brown, the president of the association, occupied the chair. Mr. Aitken regarded as by-paths such subjects as landscape gardening, geology, painting, archæology, heraldry, and music; and he dwelt on the necessity for the architect having some by-path or hobby to follow independent of, and yet to a certain degree in line with, ordinary professional work. Of landscape gardening it was remarked that its practice required a knowledge, among other matters, of plants and their habits, shrubs and their effects, and of trees and their forms and leafage, and, if deciduous, their appearance at the varying seasons of the year. The rival claims of the mixed herbaceous and the formal bedding system of flower borders were considered, and the liberal use of climbing plants and spring flowers advocated. As regarded geological study, it was observed that the architect would be specially interested to learn what immunity his buildings might enjoy from the wearing, natural action of rain, frost, and sunheat, or of the destructive effect which the artificial agencies of city and industrial life might have on his carefully-designed works. Under the head of painting, the introduction of coloured materials into modern external architecture was alluded to, and the good effect of the red-tiled and stone-slated roofs of some of the old Surrey and Lancashire mansions was illustrated by sketches. The untrueness to fact of black-and-white exhibition drawings was pointed out, and was adduced as a probable reason why the public took so little interest in the architectural rooms of art exhibitions. The employment of water-colour was advocated as the proper medium for representing architectural work. The study of archæology was illustrated by an analysis of the north transept of Furness Abbey, compared with the coeval and corresponding one of Kirkstall. Alluding to the need of some monographs of the more important Scottish ecclesiastical buildings, Mr. Aitken suggested that it might be a wise thing for the Edinburgh Architectural Association to foster such a scheme by offering out of its superfluous funds prizes for the best sets of measured drawings of some of the Scottish abbeys, such as Melrose and Holyrood; and probably the Glasgow Institute might see its way to take up the cathedral of its own city. References to the desirability of a knowledge of heraldry and music brought the lecture to a close, the lecturer speaking of organ construction and church-bell ringing under the latter head.

MANCHESTER ARCHITECTURAL ASSOCIATION.—The fourth ordinary meeting was held on Tuesday evening at the Diocesan Buildings, Mr. E. Hewitt in the chair, when a paper was read by Mr. F. Bennett Smith, subject: "A Visit to the Doulton Pottery Works, Lambeth." After giving a general description of the history of these works and referring to the high state of excellence of the art industry carried on there, he referred to the improvements in sanitation, remarking that by using Doulton's sanitary fittings it was not necessary now to have any lead or iron piping for the object of sanitation of any building. In speaking of the ornamental condition of buildings, Mr. Smith said, Why cannot we introduce colour into the exterior designs of our buildings? Surely the time is not far distant when we may see blocks of coloured stoneware, relieved with glazed decorations, taking the place of stone and brick as building materials. Stoneware was not so likely to be discoloured by atmospheric changes, and such coloured materials would be permanent decorations. It was union amongst all lovers of art which would make such a great reform in street architecture which was so needed in that city.

MANCHESTER SOCIETY OF ARCHITECTS.—The annual report of this society, for the year 1889, has already been issued. It states that the membership now consists of 54 names, being an increase of five over last session. The chief event of the year has been the adoption by the Manchester City Council after discussion with the committee of the society of a revised code of building by-laws, which is awaiting the sanction of the Local Government Board before being issued to the public. The society has been federated with the R.I.B.A., and negotiations are in progress for uniting the society and the Manchester Architectural Association. In lieu of the prizes hitherto given a travelling studentship, value fifty guineas, was offered, the subject for the preliminary competition being measured drawings of one of the staircases in the Manchester Town Hall, together with a perspective view of the Sculpture Hall. Although all students and assistants in the district, between the ages of 18 and 25, were elegible only 15 applied for particulars, and but five sent in drawings. The studentship was awarded to Mr. P. E. Barker, A.R.I.B.A., who was articled with Mr. F. R. Barker, late of Manchester, and is now in the service of Mr. John Ely, F.R.I.B.A. Mr. Barker left England on July 18th, and, after visiting numerous places in Belgium and France, returned to Manchester on the 12th instant, and is now engaged in completing those sketches which he was unable to finish on the spot.

The foundation-stone of a new Wesleyan chapel at Heworth, near York, was laid on Wednesday week. The building will replace one erected in 1825, and is being constructed from plans by Mr. E. Taylor, of Stoneygate, York, at a cost of £1,300. The chapel is to be of brick; the front of Scarborough yellow brick, with stone dressings and in the Perpendicular style. The chapel proper will measure 44ft. by 24ft., whilst the school-room, which adjoins on the right, will be 22ft. by 15ft. in dimensions. This will be separated from the chapel by a partition, so that the latter can be enlarged if necessary. The chief contractors are—builder, Mr. T. Rawling; and joiners, Messrs. Simpson and Sons.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

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Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

RECEIVED.—M. Sachet, Rouen.—C. D. R.—J. B. and Co.—Xantho.—W. Miller.—F. W. H.

Correspondence.

R.I.B.A. SUBSCRIPTIONS.

To the Editor of the BUILDING NEWS.

SIR,—I cannot understand "Fairplay" writing as he does in your last week's issue on the subject of Fellows' subscriptions, &c. If he is a Fellow of the Institute, surely the honour the position carries with it is worth the four guineas per annum; but even if it is not, is that a sufficient reason for preventing students taking advantage of the privilege of studying in the library of the Institute? And, after all that has been said and done recently with regard to the education of architects, is it possible that a Fellow can grudge the use of the Institute premises for the purpose of examining those who have so well responded to the invitation? Thus much for what I may term the dog-in-the-manger part of "Fairplay's" letter. He wants to knock a guinea off the Fellows' subscriptions, and if he succeeded I suppose that Associates would find that 31s. 6d. is less than £2 2s., and so we should go on. The *Transactions* this year are not to his liking, and that dislike is partly because of the falling-off in quantity—a grievance to him, which to me is a merit. Then the secretary and officers are paid well, and do too much for the young and too little for the old members. Of course, I do not know who "Fairplay" is; but I venture to say that if he will place himself in the position of requiring the help of the secretary or of the officers, he will find every attention paid to his wants; but being a full-blown Fellow (as I presume he is), "Fairplay" must be away and beyond the need of anything which could be conveyed to him at the R.I.B.A. Whether that be so or not, I do hope that he will not say one word which would prevent in the smallest degree the full use of the Institute and all its accessories, to students who are earnest in the endeavour to acquire that knowledge of their profession which some day

will entitle them to place the letters F.R.I.B.A. after their names, and to pay those four guineas per annum which "Fairplay" would reduce to three.—I am, &c., Wm. Woodward.

7, Duke-street, Adelphi, W.C., Dec. 18.

Sir,—In my letter inserted in your columns last week I drew attention to the present excessive rate of subscriptions to the R.I.B.A. by Fellows, and, in effect, expressed the opinion that the senior members of the Institute are not sufficiently considering their own interests.

The first stated object of the Institute is the "advancement of civil architecture," and this cannot be so successfully promoted if the greater proportion of genuine professors of the art continue underpaid and unfairly treated by the public. Therefore I am of opinion that one of the most desirable items for the reconsideration of the Institute (in the special interest of Fellows and Associates in practice) is the "schedule of charges" to be made by architects for their professional services.

This schedule is most indefinite, and in its recomposition many of the "mays," "says," and "shoulds" with which it abounds ought to be omitted, and a clearly-defined minimum scale prepared upon a similar basis (so far as is possible) to that used by solicitors. Such a course would still leave the more able and experienced to make those further charges necessary to meet their own cases.

Having been engaged as professional witness in legal disputes, and having heard Fellows of the R.I.B.A. contradict each other in court, entirely by reason of the wavering terms of the only schedule of charges that could be referred to, I am fully assured of the urgent necessity of securing, without delay, a fair and well-considered scale of remuneration for architects, such as will, when acted upon, not only encourage members of the profession in "promoting and facilitating the acquirement of the knowledge of the various arts and sciences" connected with architecture, but also better enable them to remunerate their assistants, who may thus be enabled to acquire costly books (especially in the country) and the desirable experience of travel.

I am well acquainted with several who have passed the examination of the R.I.B.A., and it is to be deeply regretted that so much education, labour, and expense should continue to meet with the poor reward offered by architects to those they desire to employ.

In conclusion, I repeat that the subscriptions of Fellows are so excessive as to be beyond what most of us can comfortably afford. It should be borne in mind that the subscriptions of country members have been doubled, so as to equal those of town members, and the whole income of the R.I.B.A. greatly increased in other ways; but all this without corresponding advantages.—I am, &c., Fairplay.

THE EDUCATION OF ARCHITECTS.

Sir,—The letter from Mr. Lish upon the above subject which you printed in your last issue opens up a wide question, while in one important point it may be taken as a happy omen; for, evidently considering the Registration Bill as good as passed, he goes on to consider the lines to be adopted for the examinations which are to be held under the measure. Hitherto the fight has been uphill; but surely the summit must be well in view when a leading member of the Bill committee allows himself to speak with such hopeful assurance! Is he right, though, in giving—or striving to give—prominence to science and practice in such an examination, rather than to art? Should there not be a just division, and no special prominence? Has he considered the new scheme of the R.I.B.A. examinations, and the wise arrangements made for the final, which seems eminently well fitted to become the compulsory final examination when the Bill is passed? The position of English architecture at the present moment, too, is surely due to something æsthetic, and it is by no means a poor position compared with that of other countries.—I am, &c.,

One who has Passed the R.I.B.A. Exam.

SOUTH STOCKTON PUBLIC OFFICES COMPETITION.

Sir,—The competition season certainly started well by your issue of last week announcing the three separate invitations from Worcester, from Harrogate, and from South Stockton.

Being somewhat slack just now, I made up my mind to enter one or more of these lists, and accordingly wrote for conditions to the local board of South Stockton, and in due course received the inclosed conditions. The local board do not want much for their money, and the particulars are so unique of their kind that I feel sure that both you, Sir, and all members of the architectural profession will be interested in them.

As a sketch of these conditions, I may mention that the gentlemen of this noble board actually grant to competitive architects the period of under two months, including Sundays, high days, and holidays, in which they only ask the preparation of the complete working drawings, details (½in. and full size), specification, and schedule of quantities, fully priced, and ready to place in the hands of the builder. The noble board furthermore promise not to bind themselves to accept either or any of the designs, and in the event of a design being accepted, the unlucky architect will have already tendered his lowest estimate (1¼ per cent.) for carrying out the work.

Upon reading the conditions and particulars of the proposed "handsome offices," one expects this to be a £12,000 job; but the said noble board, presumably protecting public interests, limits the cost to £2,500, and the generous awards offered for the three best designs are £50, £25, and £15. Now the accepted architect is probably that gentleman who has offered to carry out the work for the least remuneration, and the premium, as usual, is merged into the commission. This is a dodge. 1¼ per cent. on £2,500 amounts to the alarming total of £31 5s., and, I suppose, the board will dine off the balance of the £50 premium.

In conclusion, Sir, I may add, that I should be glad if you could draw attention to the unfairness of this competition through the medium of your valuable paper, as I think it would only be proper for legitimate architects to defend themselves.—I am, &c., A. W. S.

SLIPPERY ROADS.

Sir,—In last week's Building News you draw attention to the danger and cruelty to horses on roadways with steep gradients whenever they get into a greasy condition, and say that it would be well "to institute some new kind of paving which would give a better foothold for horses during the season."

Such a new kind of paving has been invented, and may be seen laid down in Wellington-street, Strand, close to Covent Garden Market. I do not know how long it has been there; but it certainly appears to be the very best thing yet tried for the purpose for which it is intended.

The new roadway appears to be constructed with ordinary wood blocks with the corners rounded off, and a strip of wood about ½in. wide put in between the blocks, the space between the blocks formed by this strip of wood being filled up nearly to the top with asphalte. The slightly rounding of the corners of the blocks appears to give the horses as good or better foothold than the old granite cubes, so that this system of road-making combines the security of granite with the noiselessness of wood-paving.

All who take an interest in horses should see how the problem has been solved, and in how simple a manner, and they will probably exclaim, as I did, "How effective, and yet how simple! Why was it not thought of before?"—I am, &c.,

Arcanus.

A public meeting of those interested in the restoration of the ancient kirk or cathedral of St. John, Perth, was held on the 12th inst., under the presidency of the Lord Provost, to consider proposals on the matter. There was a very large attendance. At present the edifice is partitioned off to serve three different congregations, and the chairman said that any change involving the removal of these partitions would require, in addition to the sanction of the town council, as custodiers of the kirk, to have the concurrence of these congregations, and that it might be necessary to provide one or more new places of worship. It was unanimously decided that the restoration be proceeded with. A large committee was then appointed with powers to act in the matter, all the architects practising in "the fair city" being nominated as members.

The ratepayers of Whitechapel have declared in favour of adopting the Public Libraries Acts, by 3,553 votes for the proposal to 935 against.

Intercommunication.

QUESTIONS.

[10175.]—**Buttress.**—Will some reader kindly assist inquirer by showing, working out both graphically and by moments, to find the necesssary projection for the buttress in the following case? Span of roof 38ft., slope of roof 45°, truss a collar beam, collar half-way up; weight of one truss and its load, at 56lb. per foot, 14 tons; trusses 9ft. 8in. centre and centre, church wall 14in. thick and 18ft. high ground to eaves.—J. W.

[10176.]—**Air to Grate.**—Will some reader who has actual knowledge from experience kindly say correct point to supply air to ordinary grate, whether under grate, and if so, floor or side; whether over fire, or whether away from grate a short distance in floor of room?—J. W.

[10177.]—**Hot-Water Apparatus.**—Seven years ago I fitted up a hot-water apparatus in a gentleman's house having a 3-16 plate galvanised close hot-water tank, and much to my surprise, on examining same about two years ago, we found the bottom of tank had been completely eaten through, and we then replaced same by a new tank. About a week ago we had another complaint, saying the tank was leaking badly. On looking to same, we found this one had also been eaten through in the same way as previous one. I have fitted up many tanks, but never found any before like these. Could any chemical action set in and cause this to be eaten through so quickly? There is a 1¼in. copper flow-pipe, and 1¼in. iron return from tank to boiler, and the cold-water tank is about 2ft. above this tank I am talking about.—C. F. Lear.

[10178.]—**Projecting Sills.**—A and B have property adjacent. A's eaves gutter (half-round) was several feet above B's eaves; but B raises his building another story, and projects his window sills 2½in. over the gutter of A. What legal grounds has A to order B to cut off his sill, and correct any other projections above? Authority would be esteemed.—Querist.

REPLIES.

[10160.]—**Fireproof Floor.**—Replying to "J. W. S.," concrete, by reason of its natural tendency to crack from the expansion of the iron, is becoming obsolete as a "fireproofing" material for girders. The modern method of fireproofing floors, &c., is to fix up under the joints or girders slabs of fire-resisting plaster, with an inner lining of non-conducting silicate cotton, thus forming a complete and perfectly indestructible ceiling at moderate cost. —E. Gardner.

[10164.]—**Church Decoration.**—A considerable experience has taught me that paintings for church decoration are far better done on well-seasoned oak, and not on the walls at all. Those drawn on the latter fade and fail. I know scarcely a single modern example in England of an exception, in a good state of preservation. Let the paintings for decoration be done upon stout oak panels, strengthened from behind by bands of wood across, then framed in a well-moulded but severely-designed frame. At the corners of the frame let a stout piece of cork be attached to each to resist dampness, and then let the decorative pictures be hung up. The money spent at Christmas and Easter, &c., on the fripperies and follies of advertising tradesmen for church decoration would in a few years suffice to procure good figures and figure-subjects of permanent interest, use, and value.—Frederick George Lee, D.D.

[10168.]—**Party-Walls.**—"Architect" cannot do better than fill in the 3in. cavity in his hollow wall with silicate cotton to prevent the transmission of sound. I have also found it an excellent plan to fix Hitchins's Combination Plaster and Silicate Cotton Slabs against existing walls. The most cleanly and effective pugging for floors is a 1in. thickness of silicate cotton laid on the sound-boarding, placed close up within 1in. of tops of joists.—James Christie.

[10168.]—**Party-Wall.**—A 12in. wall made of two 4½in. thicknesses, with a 3in. hollow between, is rather thin, though for a two-storied building would be sufficient. The air cavity is a good non-conducting medium. For pugging floors, coarse plaster mixed with chopped hay may be used, or slag wool.—G. H. G.

[10170.]—**Articles.**—The deed of apprenticeship is often retained by the solicitor who drew it up. Was there not a copy?—G. H. G.

[10173.]—**Charges.**—If the plans of houses are varied the commission of 5 per cent. on the total cost would be fair; if they are all of the same design, a modified charge may be made—say 5 per cent. for one and 2½ per cent. for each of the others. The charge for quantities may be 2½ per cent. on the lowest tender. Travelling expenses are charged extra.—G. H. G.

Last week the second instalment of the work of restoration of St. Mary's Church, Haverfordwest, was completed. Three years ago the north aisle was restored, and now the spacious chancel has been reopened, after complete renovation. The roof has been entirely renewed in oak, the walls re-cased and tinted in salmon colour, the stonework of all the windows, where decayed, restored, and the flooring laid with tiles, increasing in richness as the sacrarium is approached. The old organ, removed from the western gallery, has been rebuilt and much enlarged by Messrs. Hill and Sons at a cost of £520, and now contains over 1,800 pipes and 37 stops. The new altar and its arrangements are of the most costly description. The communion table is vested in a crimson velvet frontal and superfrontal, embroidered in gold and colours, with rich fringes. The frontal cost 100 guineas, and was the work of Messrs. Helbronner, of Regent-street, London. The eagle lectern, standards, and other brass work were supplied by Mr. Hardman.

LEGAL INTELLIGENCE.

Contravening the By-Laws of a Rural Sanitary Authority.—John A. Deacon, a joiner and builder, of Hugglescote, was summoned at the Ashby-de-la-Zouch Petty Sessions on the 30th Nov. by John W. Metcalf, surveyor to the Ashby Rural Sanitary Authority, for contravening one of the by-laws of the said authority on the 17th August by constructing dwelling-houses not in conformity with the by-laws. The actual grievance of the sanitary authority was that the defendant built some houses at Hugglescote, the plans of which showed the outer end wall of the main block 9in. thick, whereas the wall had only been built 4½in. thick on the ground story; and also with erecting the external walls of pantries 4½in. thick instead of 9in., as shown on the approved plans, and as required by the by-laws. The defendant was fined 10s. 6d. and costs.

The Reredos of St. Paul's.—In the Court of Appeal on Thursday, Friday, and Saturday, the Master of the Rolls and Lord Justices Lindley and Lopes being on the bench, the appeal was heard of the Bishop of London against the order of the Divisional Court requiring him to proceed under the Public Worship Act, 1874, in reference to the removal of certain sculptured figures, representing Our Lord and the Virgin Mary, at St. Paul's Cathedral. Sir Henry James had obtained the rule *nisi* for a mandamus mainly on the ground that the Bishop had really decided on the authority of the Exeter case, whereas it was not, as he contended, applicable. The Court of Queen's Bench were divided in opinion, Lord Chief Justice Coleridge and Mr. Justice Manisty deciding the mandamus must issue, and Mr. Baron Pollock being of a contrary opinion. The Bishop of London appealed. The Attorney-General stated the facts at considerable length. He contended that by the Public Worship Regulation Act a discretionary power was conferred upon the Bishop, and that if the Bishop had exercised his judicial discretion, the Queen's Bench Division had no authority to review the decision at which he had arrived, even though they might be of opinion that such decision was erroneous. Mr. Jeune, Q.C., followed on the same side, while Sir Henry James, Mr. Moulton, Q.C., and Mr. Dankwerts argued in support of the application, and urged that under the terms of the Public Worship Regulation Act, taken in conjunction with the Church Discipline Act, the Bishop had no power without the consent of all parties to decide as to the legality of the reredos.—The Master of the Rolls and Lords Justices Lindley and Lopes delivered judgment on Tuesday. The Master of the Rolls said that it had been alleged on behalf of the mandamus that the Bishop had exceeded the duty imposed upon him by the Statute, or had not undertaken the duty imposed upon him—the one or the other. The Court had to determine whether the Bishop had either declined or exceeded his jurisdiction, and in doing so it was necessary to consider what the jurisdiction was. Under the Public Worship Regulation Act, Section 9, the Bishop had to form an opinion, and to act upon it as between the persons complaining and the persons complained of, and to say whether proceedings should or should not be taken. That this was a matter of discretion could not be doubted and was not denied. If he had honestly and fairly undertaken to consider the case and all its circumstances, and then came to his decision, then he had not failed to undertake the duty imposed upon him. The question whether that decision was right or wrong was not a subject for interference with by a mandamus; and if he gave his reasons the Court had no authority to inquire into the rightness or wrongness of these reasons. If he came to the conclusion that the case of "Philpotts v. Boyd" had decided that a reredos might be erected in a cathedral, he had a right to consider, in reference to the St. Paul's reredos, the application of the principles to the case before him. He was entitled to consider what was the character of the reredos in question, for what purpose it had been set up, to what end and use it was put, and whether there was danger of its being abused. The case of "Philpotts v. Boyd" would teach him that he might look at the reredos complained of, consider the sculptures on it, and see whether it was clearly and beyond doubt a decoration, or whether there was a doubt as to its being within any known principles and rules. It would be then well for him to consider how it had been applied in other cases—for example, in the Durham and Denbigh cases. If he saw no material differences between the cases, he had a right to come to the conclusion that they were so minute that litigation regarding them would not be of any benefit to the Church. The ordinary rules of the application of the law to a mandamus had been exceeded by the Court of Queen's Bench. The majority of the learned judges had exceeded the powers of their Court, and therefore he was of opinion that this mandamus must be discharged and the appeal be allowed. Lord Justice Lindley concurred, and Lord Justice Lopes took a similar view.

Compensation Award against the London School Board.—The umpire (Mr. F. T. Galsworthy) appointed in the compensation case of "Button v. the School Board for London" has published his award, to the effect that the sum of £4,455 shall be paid by the Board to the claimant, the latter undertaking to construct a roadway in front of the land taken by the Board. Mr. Button had claimed upwards of £8,000 as compensation for the compulsory purchase by the Board of a portion of his freehold building estate at Stamford Hill, containing an area of 65,945 square feet. This amount included a sum of £1,570 for damages alleged to be caused to the adjacent portions of the estate by the intrusion of a Board school upon it. It was argued for claimant that in an estate of this character, laid out for houses of £40 to £100 rent, a Board school was objectionable, and in this view he was supported by the evidence of Mr. Tewson, Mr. Vigers, and Mr. Watney, land agents. Sir W. T. Marriott, on the other hand, was supported by the experience of Mr. Walker, Mr. Adams, Mr. Collier, and Mr. Young, the Board's surveyor, in the contention that, as people of the middle class were increasingly making use of the Board schools for their children, the proximity of a school was becoming an advantage, rather than otherwise, to residential property of this character in suburban districts such as Stamford Hill.

WATER SUPPLY AND SANITARY MATTERS.

Demolition of Houses in Chelsea.—Mr. Whitmore, M.P., and Prebendary Eyton headed a deputation to the Chelsea vestry, on Tuesday, to protest against 240 houses of the poor being pulled down for the erection of mansions without providing accommodation for about 3,000 poor persons. Mr. Whitmore said they wished to draw attention to the demolition of property in the neighbourhood of North-street, near Cadogan-square, and to urge the vestry to secure that some provision should be made for the re-housing of the working classes. In the next five years some 2,300 persons would be turned out of the neighbourhood of North-street, and would have to find new homes, either in the suburbs or in the poorer districts, which were already overcrowded. The County Council possessed compulsory powers to acquire land to build houses for the working classes. Sir Charles Dilke said he doubted whether the County Council possessed the powers mentioned. The vestry promised to consider the question when the plans relating to the scheme were placed before them.

Liverpool Branch Sanitary Inspectors' Association.—The second annual dinner of the Association of Public Sanitary Inspectors of Great Britain (Liverpool Centre) was held on Saturday. Dr. J. Stopford Taylor, medical officer of health of Liverpool (vice-president of the association), presided. Dr. F. Vacher proposed the toast of "The Association." The profession of a sanitary inspector was, he remarked, a comparatively new one, and all other professions had found it necessary to organise in order to bring the individual members of the profession into juxtaposition. They would want recognition from the Goverment, they would want concessions and protection which could not be obtained if they were merely individual members of the profession scattered throughout the kingdom. Their profession was one which was rather preventive than curative. Dr. Taylor responded to the toast. He gave a sketch of the insanitary condition of Liverpool some half-century ago, and traced the progress of sanitary reform to the present time. In 1846, with a population of 240,000, there were 9,707 deaths, while in 1888, with a population of 600,000, there 12,159 deaths. If last year's mortality rate had been the same as in 1846 there would have been 25,000 deaths.

Metropolitan Sewage.—The London County Council received on Tuesday a report from the Main Drainage Committee stating that they had considered the report of the late engineer, Mr. Gordon, and recommended that tenders should be obtained for the construction of two sludge vessels upon the model of the older and less costly ship, with their modifications. After discussion, it was resolved, by 50 votes to 44, to refer the subject to the committee, with a recommendation to secure the services of an eminent engineer to join the engineer of the Council in a thorough examination of the whole sewage system, and that the engineers should give an approximate estimate of the cost of taking the whole sewage to the sea; and that, pending the presentation of the report, estimates should be obtained from shipowners as to the cost of carrying the sludge to the sea for one year from April next.

At the meeting of the Liverpool City Council, the Health Committee recommended that a successor be appointed to Mr. Clement Dunscombe (now engineer to the London County Council), in the office of chief engineer, at a salary of £550 per annum, increasing £50 per annum to £1,000. The recommendation was adopted.

Our Office Table.

St. Philip's Church, Birmingham, which has been recommended by the Bishopric Committee as the cathedral church of the proposed new See of Birmingham and Coventry, is a typical example of the English Renaissance founded by Wren, and continued by his pupils, of whom its architect, Thomas Archer, was one of the most successful. The church was built between 1711 and 1715, under a special Act of Parliament, the preamble whereof recites that there is only one church (St. Martin's) in the parish of Birmingham, and that it is expedient to erect another in the "high town quarter." The area is divided into nave and aisles by square fluted pillars carrying semicircular arches, and supporting galleries which extend over the aisles. Originally the chancel was but a shallow recess, but during the restoration, effected from the designs of Mr. J. A. Chatwin, in 1884-5, it was lengthened by one bay. The east window and the apsidal ones flanking it on north and south are filled with stained glass designed by Mr. Burne-Jones, A.R.A., a native of the city; the central subject is the Ascension, and to north and south are the Nativity and the Crucifixion. St. Philip's occupies one of the best sites in Birmingham on the high ground between Temple-row and Colmore-row, and is a good specimen of the Later Queen Anne style, but except for its central position in the midst of a business community, has few claims to be made the seat of the Bishop's chair in a see conterminous with a county which contains St. Michael's, Coventry; St. Mary's, Warwick; and Holy Trinity at Stratford.

Once more the claims of the Elgin Sculptures to be regarded as the actual handiwork of Phidias are being denied, this time by Dr. Puchstein, Assistant Custodian of the Berlin Museums. Dr. Puchstein believes that the Elgin Marbles were probably carried out by Kallimachos, who lived about seventy years later, and whom Pausanias styles, from his practice of carrying the detailed niceties of execution to excess, "the diluter of art." The chief fact on which he bases this theory is that the folds of the drapery in the Elgin Marbles were evidently produced by means of the so-called "running borer." He endeavours to establish the theory that this tool had not yet been invented in Phidias's time, so that his draperies have a much more archaic look, such as is seen in the reliefs on the pedestal of the Parthenos, dug out at Pergamos, and now in Berlin. Dr. Puchstein intends shortly to publish the proofs which have convinced him of the truth of his theory, with numerous illustrations.

The Royal Scottish Academy has just lodged with the Privy Council a voluminous reply to the charges brought against it in what are generally described as "anonymous letters," following the publication of the draft new charter and the petition by "architects practising their profession in Scotland." The document records the history and objects of the Academy, and gives full particulars as to the various bequests made to them for prizes to students. They deny the charges of mismanagement and malversation of funds, and defend the pension system and the salaries given to the members who conduct their business. The Academy point out what was done to meet the views of Scottish architects who communicated with them regarding the new charter, and state that the intention of the Academy to apply for such a charter was known to Dr. Rowand Anderson, Mr. David MacGibbon, and Mr. H. J. Blanc, the three architects whose names appear first on the architects' petition; and that while the charter was under revision no suggestions for improvements or for conferences to consider requisite amendments were made by these gentlemen during the sixteen months in which the draft charter was under consideration, nor until it was nearly ready for presentation to Her Majesty in Council.

The memorialists assert that of the 233 persons signing the architects' petition, many of them are not architects in the proper or artistic sense of the word, but only builders or surveyors. Among the Edinburgh petitioners some do not appear in the directory either as architects or as carrying on any other profession or trade. One is known to be an architect's clerk, and others are believed to be apprentices or clerks. It is

made matter of complaint that while the architects asked a conference, and wasted a great deal of time in correspondence, they did not avail themselves of an opportunity given by the Academy to have a conference to discuss the draft charter, but backed out of it on the ground that the Academy would not show its accounts. The Academy denies emphatically that it has "systematically slighted and ignored architecture as a branch of art." It was not its fault, but the fault of the architects themselves, in that they had not applied for admission to membership, that more of them had not been elected members. In 21 years eight architects only have applied as candidates for associateship, as compared with 140 artists in other branches of art.

Since the erection of new buildings at Westminster School, where the boys are now taught in distinct and separate classes, the large schoolroom has been no longer used for its original purpose, but is reserved for occupation on special occasions. Its walls have been recently lined with an oak dado designed by Mr. J. L. Pearson, R.A., which, in conjunction with the old open-timber roof, has greatly added to the dignity of the interior. It is proposed to decorate the panels of this dado with the armorial bearings of such deceased "Old Westminsters" as are well known to fame, and Mr. C. L. Eastlake appeals to old Westminster boys for aid in carrying out the scheme.

An ambitious but commendable project has been launched by the Birmingham Photographic Society for the photographic survey of Warwickshire. It is suggested that the amateur and professional photographers of the county shall divide the shire into districts, and photograph every landscape and inn, ruin and old coffer, historic tree, and antique sign. In fact, it is proposed that what Halliwell-Phillips began to do for Stratford-on-Avon, at his own expense, should be done for the whole of the county by owners of cameras as a voluntary effort. Eighteen members having memorialised the council of the society to this effect, a special general meeting of the members was held at the Grand Hotel, Birmingham, on Wednesday week, to consider the whole matter, Mr. J. B. Stone presiding. Mr. W. Jerome Harrison, F.G.S., vice-president, submitted some notes on the proposal. A committee should be appointed to superintend the survey. The committee would purchase maps of the county on the 6in. scale, decide on the first patch to be surveyed—say, that included on 12 sheets of the map—and allot the sections by ballot to the workers. Two friends might work one section—say, one contained in a quarter-sheet of the 6in. map, including an area of six square miles. A selection of the most interesting photographs, accompanied by descriptive letterpress, would be published. The society would retain, at least, two complete sets—a working set and one for reference. Complete sets ought also to be prepared for the Reference Library, for the British Museum, and other public institutions. On the motion of the chairman, seconded by Professor Hillhouse, it was unanimously resolved to proceed with the scheme, and a provisional committee was appointed. No county is more rich in archæological and antiquarian remains, hallowed by historical associations, than is Warwickshire, while the comparatively limited area to be covered, and the pertinacity of the men of Birmingham, render it probable that this enterprise, well described by a member of the committee as "stupendous," will be carried to a successful issue. The series of illustrations will be invaluable to future generations.

Mr. Arthur Hill, B.E., architect, of Cork, has reported to the Royal Historical and Archæological Association of Ireland, calling attention to the threatening condition of some portions of the roofless but very beautiful ruins of the Dominican Abbey of Kilmallock, co. Limerick—"the Baalbec of Ireland." Unless some pointing and slight repairs are executed and the walls coped—all matters requiring a very slight expenditure—a few years will make a great change for the worse in what remains of the abbey. The eastern gable, which contains a fine group of five lancet lights, separated only by slight millions, and the end of the south transept, filled by an excellent specimen of 15th-century net tracery, are, however, in a tottering condition, and if the latter window is to be saved from utter destruction, it should be taken down and reinstated at once. The report appears in the quarterly *Journal* of the Association, and is illustrated by wood engravings of the exterior and grass-grown interior. An historical account of the abbey is given in the same issue by the Rev. James Dowd, who shows that it was founded in 1291 by Gilbert, head of the clan Gibbon, and completed by his son Maurice, who in 1357 was buried with his wife in the church.

Mr. B. Priestley Shires, past hon. sec. York Architectural Association, delivered his popular lecture on "The Domestic Architecture of the Edwardian Period," on Wednesday last in the large lecture hall connected with Batter-street Church, Plymouth. There was a large attendance. The Rev. Alfred Cooke presided. The lecturer spoke at length on the historical and literary references to the subject, and alluded to the arrangement and plan of Edwardian houses and castles, to the furniture, tapestry, manners, and customs of the time; windmills, water-mills, and public roads of the period. The lecture was profusely illustrated by Mr. Shires with large cartoons and sketches. At the conclusion of the lecture Mr. Shires was accorded a hearty vote of thanks.

National Registration of Plumbers.—Plumbers Registered Since 1st November. 1889.

London Masters.

Broad, J. F., 21, Upper Grange-road, Bermondsey, S.E.
Chaney, J., 43, Great Saffron-hill, Holborn, E.C.
Farley, C., 23, Reedham-street, Peckham, S.E.
Gray, H., 1A, Frederick-mews, Stanhope-place, Hyde Park, W.

London Journeymen.

Andrewartha, G., Rose Cottage, Hampshire-street, Camden-road, N.
Bidwell, F., 11, Napier Villas, New-road, Crouch End, N.
Brashier, B. C., 14, Dorrington-street, Brooke-street, Holborn, E.C.
Cole, C. H., Hampton Court Palace.
Creighton, J., 55, Vicarage-road, Tottenham.
Fell, C. B., Somerset-road, Teddington.
Harrington, A. B., 39, Coburg-road, Old Kent-road, S.E.
Horton, C., 121, Brunswick-road, Poplar, E.
James, W., 16, Woodville-road, Walthamstow.
Lowden, A., 72, Cathnor-road, Shepherd's-bush, W.
Lynes, T. G., 11, Grace-street, Hemingford-road, N.
Maidment, C. J., 100, Islip-street, Kentish Town, N.W.
Moyes, G. F., 64, Rednall-terrace, Gt. Church-lane, Hammersmith, W.
Oakman, H. J., 40, Usher-road, Bow, E.
Ogden, A. L., 69, Winchester-street, Warwick-square, Pimlico, S.W.
Rickards, A. J., 53, Beadnell-road, Forest Hill, S.E.
Russell, A. L., care of Mr. Cole, 29, Bradmore Park-road, Hammersmith, W.
Shiells, J., 11, Shawfield-street, Chelsea, S.W.
Smerdon, G. E., 30, New North-street, Theobald's-road, W.C.
Talmadge, C. W., 36, Wilson's-street, St. Leonard's-road, Poplar, E.
Tinsdill, Rd., 382, Munton-road, New Kent-road, S.E.
Vincent, C. R., 40, West-square, Southwark, S.E.
Wells, E. S., 3, Wilson-place, Lower Sydenham, S.E.

CHIPS.

Mr. Francis Roubillac Conder, the civil engineer and scientific writer, died suddenly at Guildford on Wednesday, while reading in his study. His experiments in the deodorisation of sewage are well known, and his iron process is in use at Windsor Castle, Chichester Barracks, Alnwick, and many other places. Major Conder, the eminent Palestine explorer, is a son of the deceased.

The Forth Bridge will be formally opened in March by the Prince of Wales.

A series of casts of small stone figures of female saints or Virgins from the west front of Auxerre Cathedral, illustrating French Gothic sculpture of the 13th century, has been added to the collections in South Kensington Museum.

A monument bearing on a medallion a portrait of the late Gen. Sir Charles Trollope, K.C.B., has been placed in the Trollope chapel of Uffington Church. It has been executed by Mr. W. F. Woodington, of Brixton, S.W.

The parish church of Kingsteignton has been enriched by the addition of a stained-glass window, placed in the south aisle. It is of four lights and in the Perpendicular style. The two left-hand lights contain a representation of the Parable of the Wise and Foolish Virgins. The two other lights on the right illustrate the Blessing of Little Children by Our Lord. The window was designed and executed by Mr. F. Drake, of the Cathedral-yard, Exeter.

The town council of Montrose have decided to institute a competition for plans of buildings to fill the vacant space in Hume-street, having 100ft. frontage and 30ft. depth, and to offer £100 in premiums.

The tender of Messrs. McCormick and Sons has been accepted at £6,554 for erecting the free public library for Clerkenwell at the corner of Skinner and Whiskin streets. Messrs. Karslake and Mortimer are the architects.

STATUES, MEMORIALS, &c.

Edinburgh.—On the occasion of the opening of the Scottish National Portrait Gallery in Edinburgh in July last, the Lord Justice-General, referring to the niches on the exterior of the building, spoke of the appropriateness of these being filled with the statues of eminent Scotsmen, and hinted that it was for the people of Scotland to provide these statues. Acting upon the timely suggestion, three or four offers have been received to fill a niche. But before making a commencement with this work, the Building Committee have prepared for the Board of Manufactures a scheme for the guidance of intending contributors. This committee have reported that the preparation of a list of suitable subjects was a task of no little difficulty, for as thirty figures is the limit, the selection of so small a number from the long range of names prominent in Scottish history has been found embarrassing. The architectural conditions do not favour a merely chronological arrangement, the figures having to be disposed in groups. The committee suggested the following arrangement as being the most appropriate which could be arrived at:—The four niches, the most prominent in the building, at the principal doorway, might be filled with statues of Malcolm Canmore and Queen Margaret, above, and Wallace and Bruce below. On each side of the doorway are five niches in line. Those on the left of the doorway might have figures of Alexander III., James I., James II., the Regent Moray, James VI.; and those on the right, or west side of the doorway, Lord James Douglas, Knox, Buchanan, Cardinal Beaton, and John Duke of Argyll. The remaining niches, thirteen in number, are at the turrets at the ends of the building, with a large niche in the centre of the eastern wall, in which a group of two or even three figures might be placed. The apportionment might be as follows:—At the south-east corner, four niches—Barbour, Dunbar, Gavin Douglas, David Lindsay. In the double or treble niche in the centre—Queen Mary, Lethington, and Bishop Leslie. On the north-east corner, five niches—Napier, Stair, Hutton, Hunter, and Watt. At the north-west corner, four niches—Admiral Duncan, Sir Ralph Abercrombie, David Hume, and Adam Smith. As to the names of Scott and Burns it was thought that another statue to Scott in Edinburgh was not needed, while the statue of Burns by Flaxman adorns the entrance hall of the gallery. The scheme has been generally adopted by the Board, but is not intended to be hard and fast in its details. The absence of any Scottish painter, such as Andrew Jameson or Sir Henry Raeburn, is commented on by the *Scotsman*.

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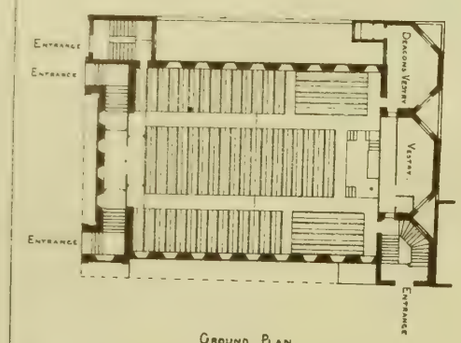
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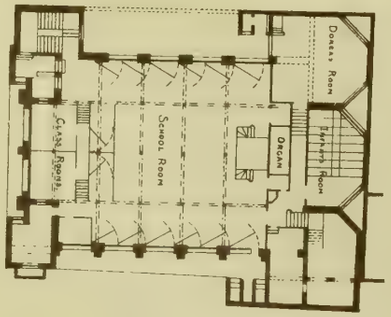
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GROUND PLAN.



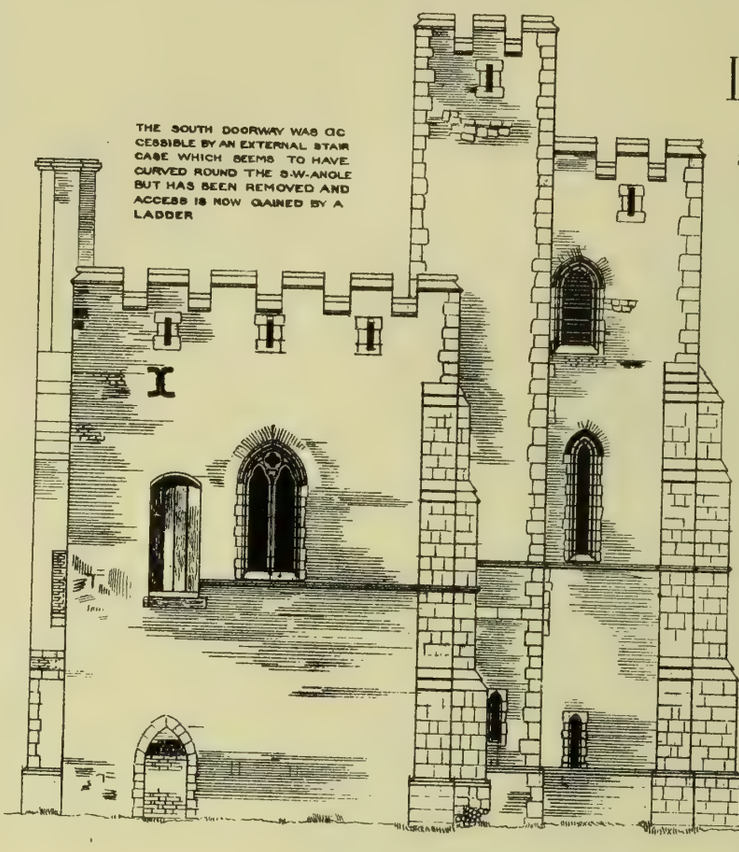
BASEMENT PLAN.

PHOTOGRAPHED BY J.F. KNIGHTS, BRIXTON

PHOTO-TINT BY JOHN ACKERMAN & SONS, CAMDEN TOWN, N.W.

NATIONAL · BRONZ

LITTLE WENHAN



SOUTH ELEVATION

SCALE OF FEET 10 5 0

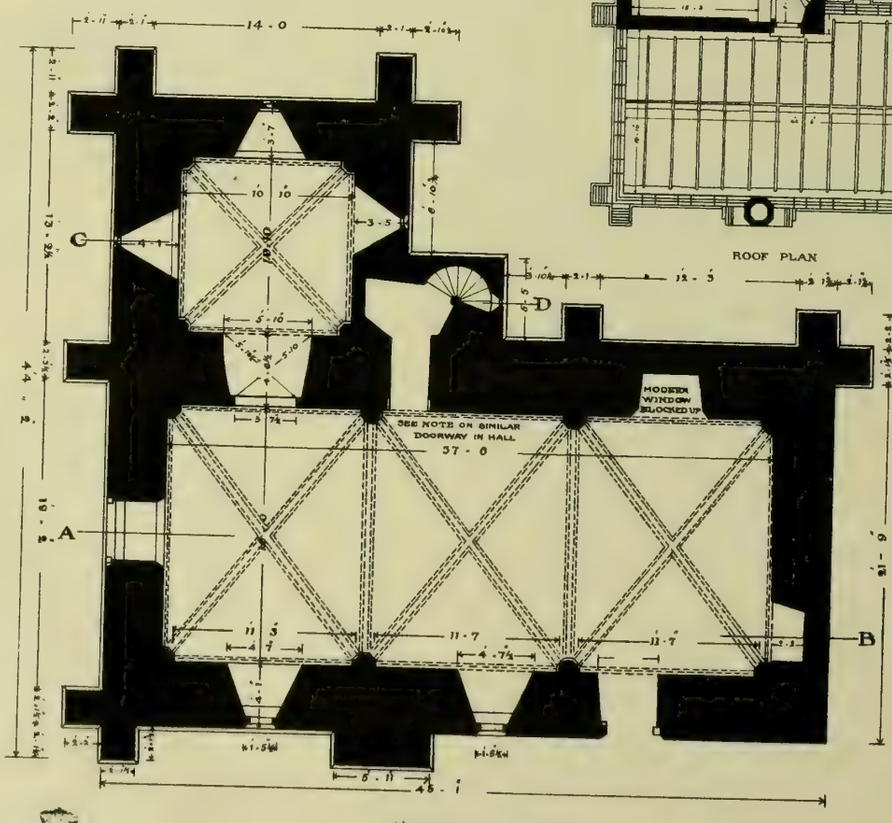
NOTE! OF THE PERIOD WHEN THIS HALL WAS BUILT NOTHING IS KNOWN BUT WHAT CAN BE INFERRED FROM THE STYLE OF ITS ARCHITECTURE, IN THE YEAR 1261 THE MANORS OF GREAT AND LITTLE WENHAM WERE HELD BY A FAMILY NAMED HOLBROKE AND IT IS PROBABLE THAT ONE OF THESE ERECTED THIS HALL. IN THE REIGN OF HENRY THE EIGHTH THE ESTATE OF LITTLE WENHAM WAS THE SEAT OF THE BREWS, AT WHOSE HANDS THE HALL UNDERWENT SOME REPAIRS BUT NO MATERIAL ALTERATION

HALF INT

SCALE



ROOF PLAN



GROUND PLAN



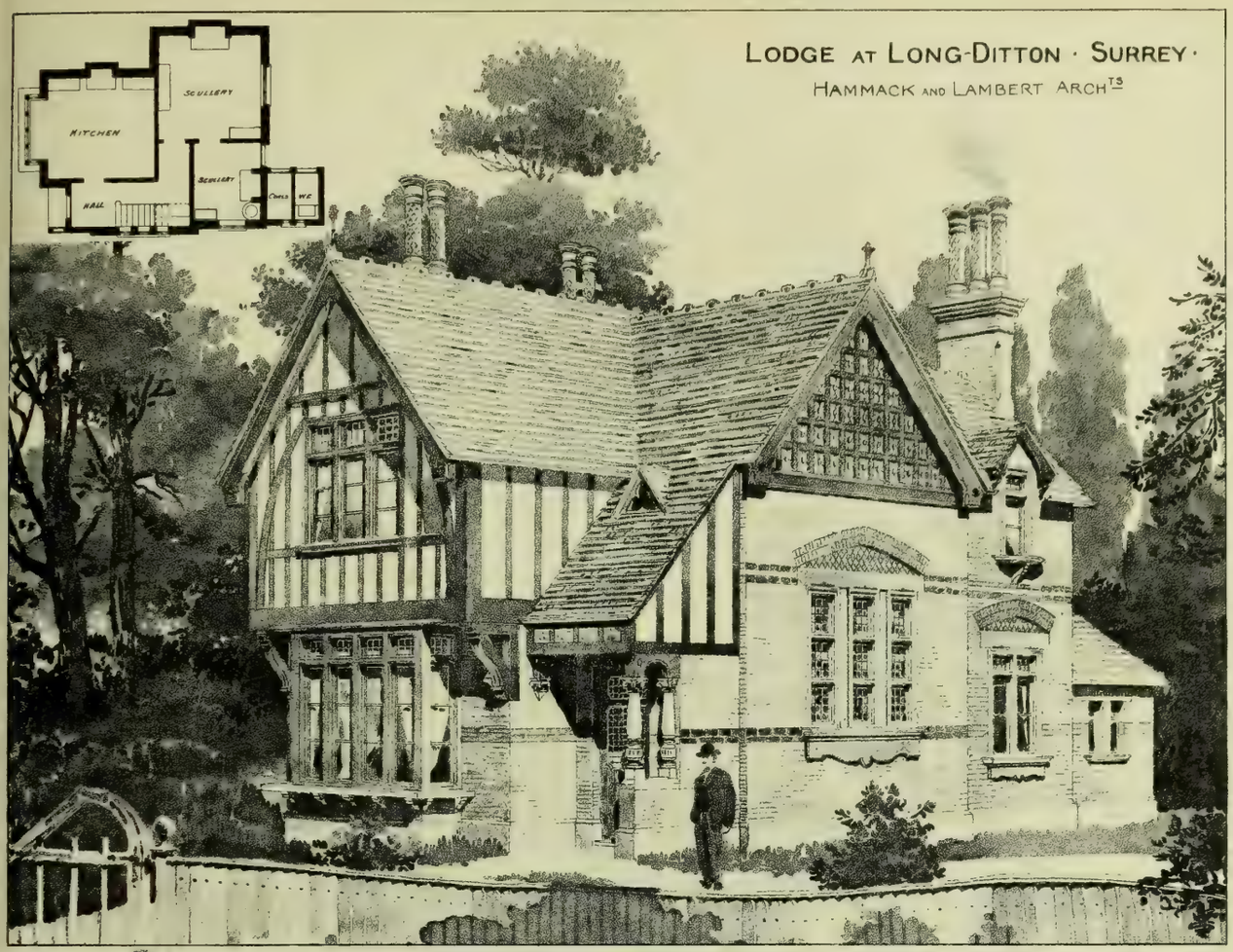
SECTIO



"PHOTO-TINT," by James Akerman, C, Queen Square, London, W.C.

CLOCK TOWER · MONNICKENDAM · HOLLAND

SKETCHED · BY · A·E · PERKINS



LODGE AT LONG-DITTON · SURREY ·

HAMMACK AND LAMBERT ARCHTS



PHOTO-TINT, by James Akerman London W.C.

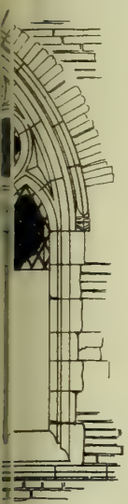
HOUSE AT NETHERHALL GARDENS · HAMPSTEAD · N·W·

WM HUNT ARCHT

DRAWINGS

LL SUFFOLK

20 30 40



ELEVATION OF
EAST WINDOW
OF CHAPEL

F EXTERIOR

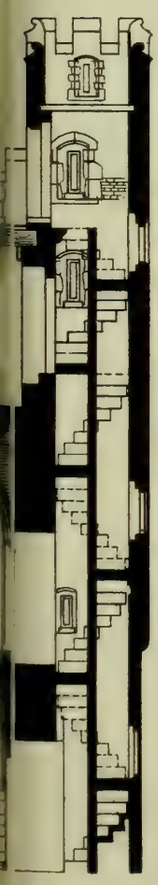
5 6 7 8 OF FEET

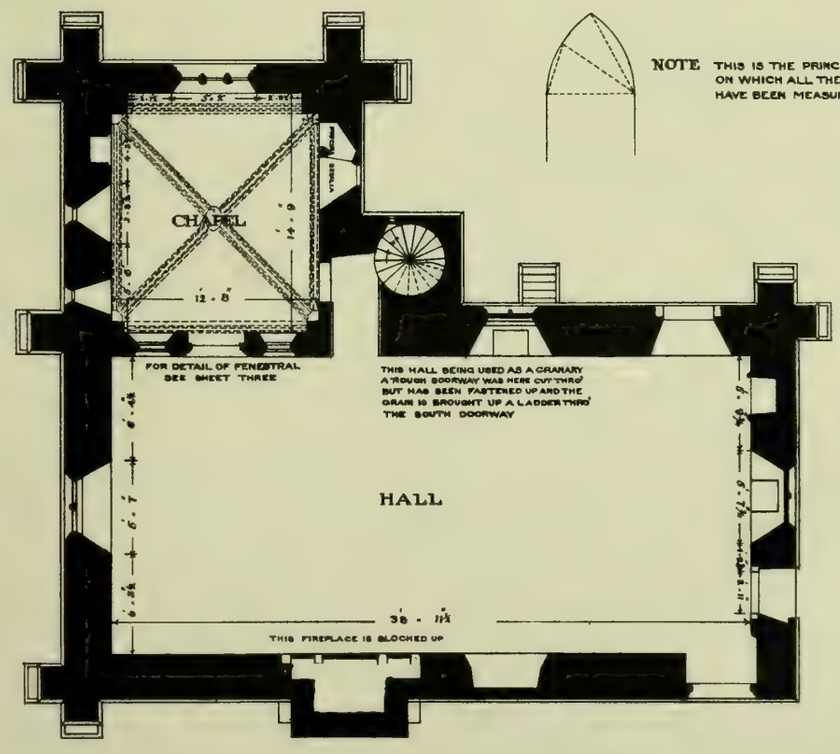




INSCRIPTION IN STONE OVER
WEST DOORWAY

NORTH ELEVATION





NOTE THIS IS THE PRINCIPLE
ON WHICH ALL THE ARCHES
HAVE BEEN MEASURED

FIRST FLOOR PLAN

Measured and Drawn by,
George William Bugg.
March 1889.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W C

3'. 6"



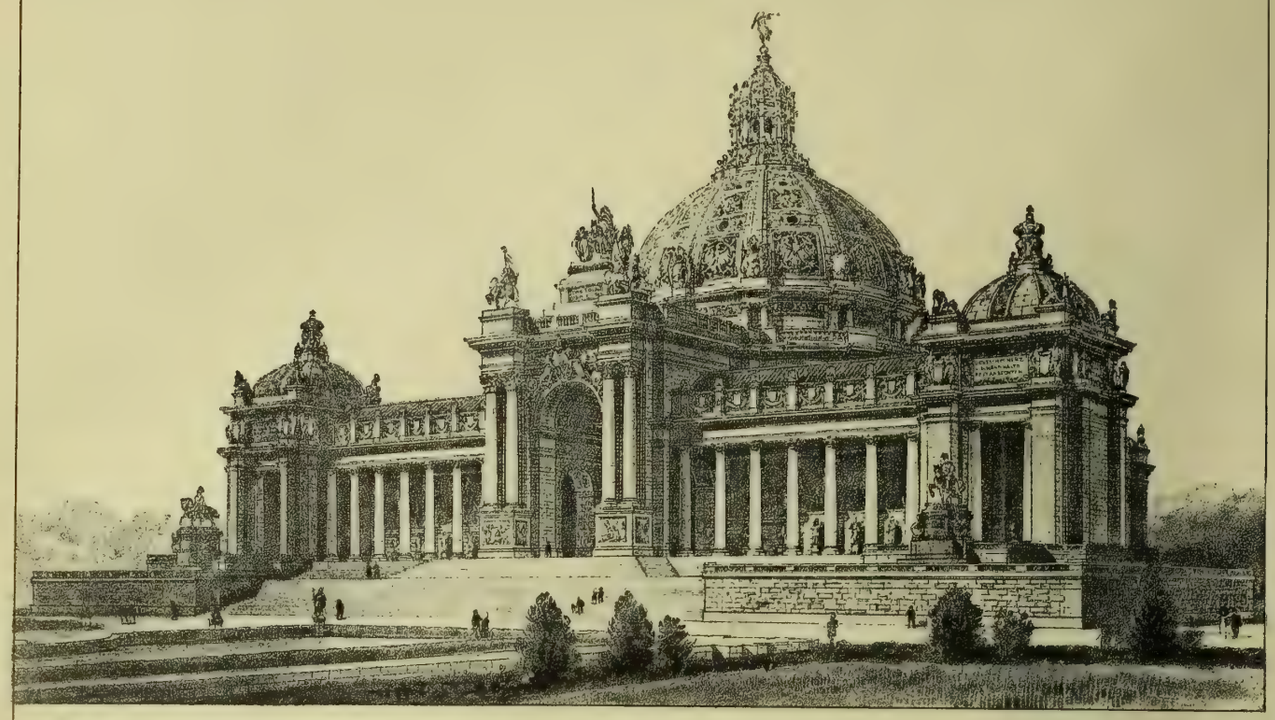
1'. 9"

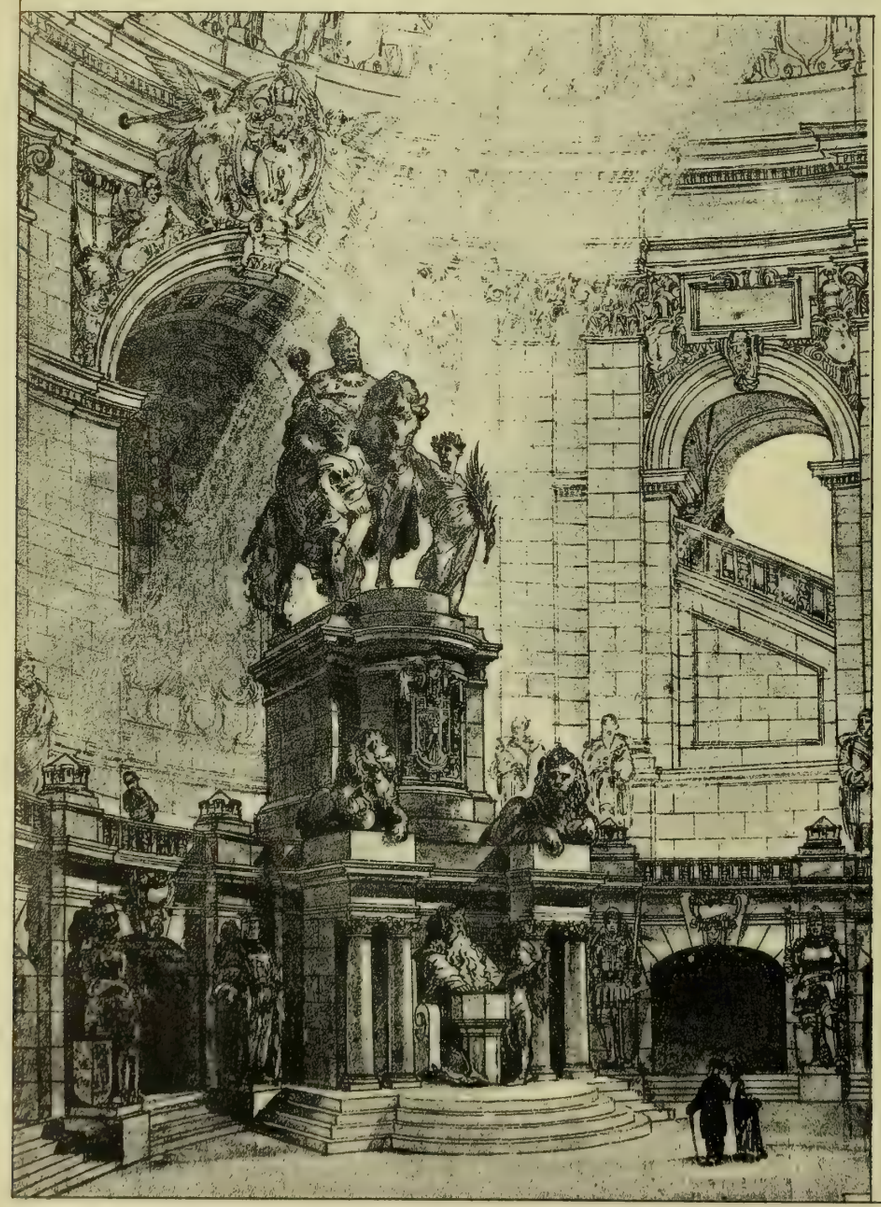
MADE BY JEFFREY & Co

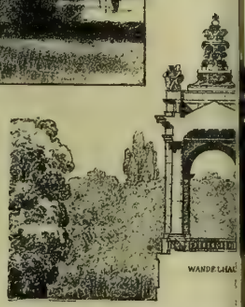
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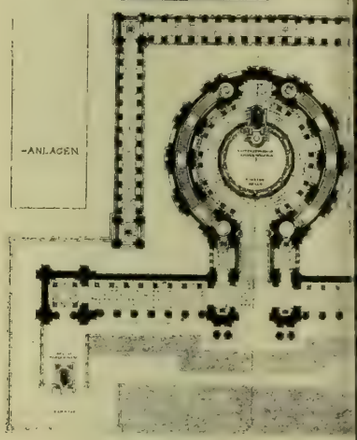
THE "PEACOCK GARDEN" DECORATION.

DESIGNED BY WALTER CRANE.





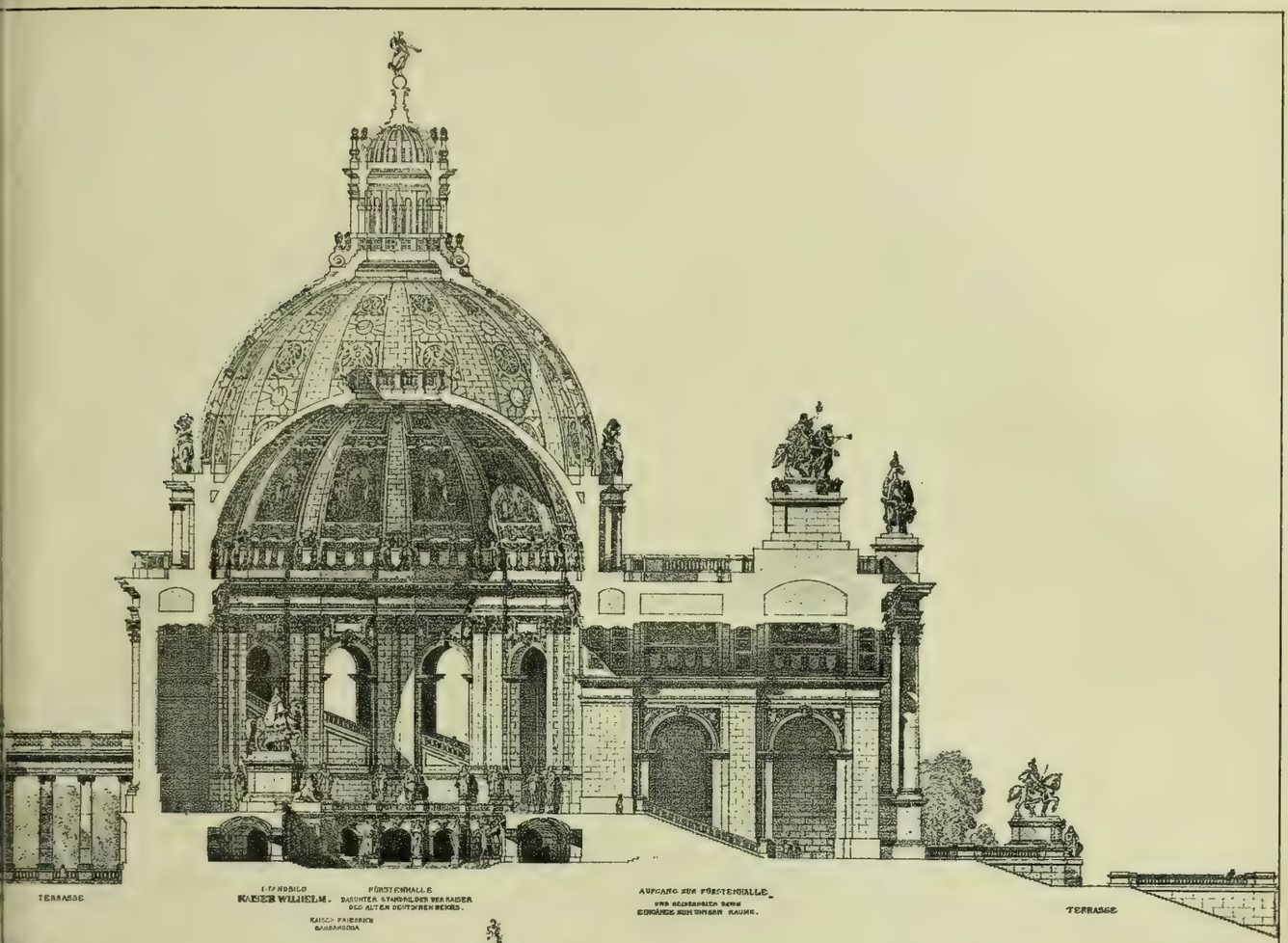


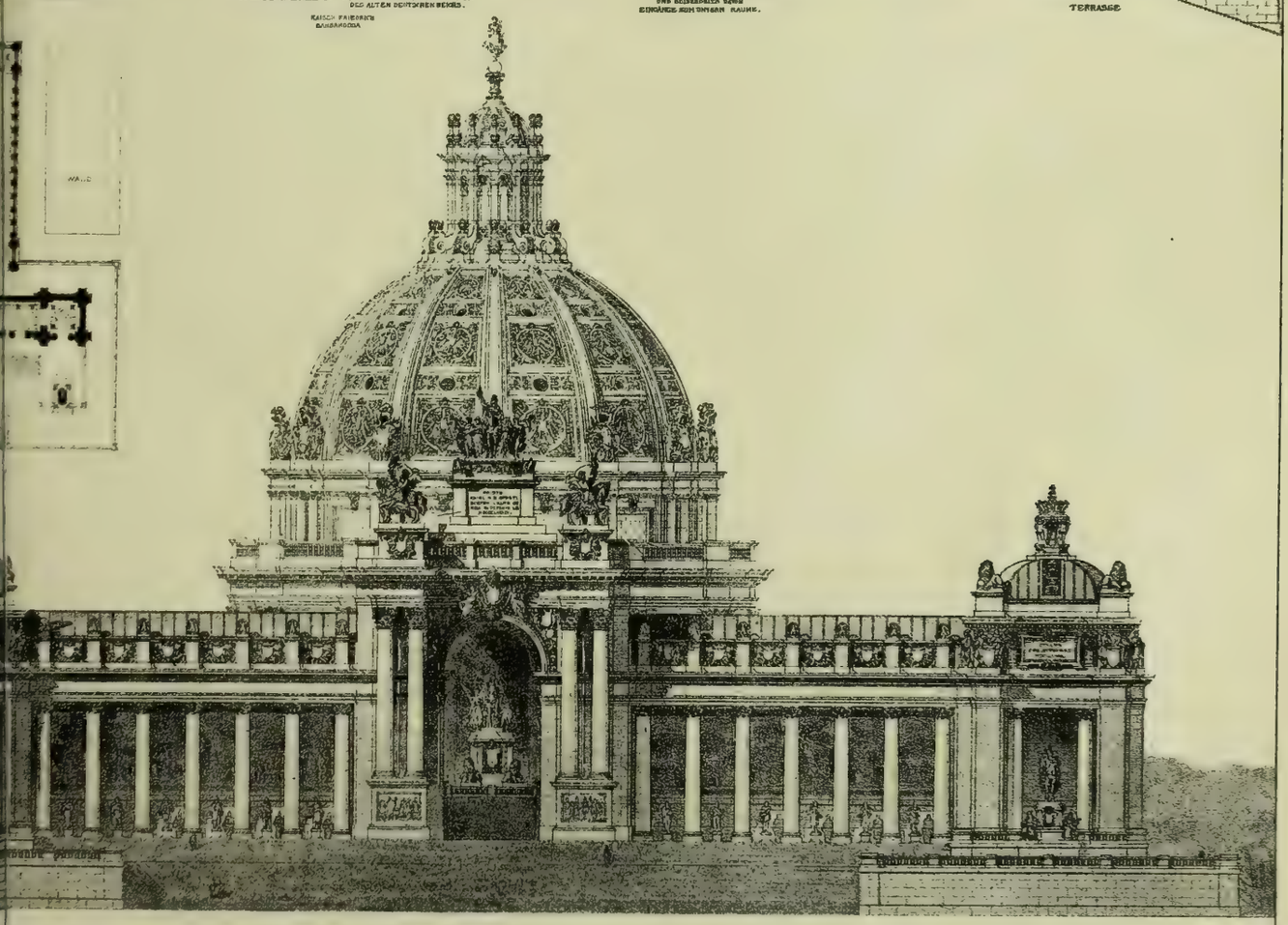




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RETTIG & PFANN ARCHTS

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LVII.—No. 1825.
FRIDAY, DECEMBER 27, 1889.

SUPERVISION OF BUILDINGS.

BEFORE very long the question of the meaning and limits of the architect's supervision of a building will have to be settled, if any importance is to be attached to this function of his work. In the interests of the busy practitioner, the question of personal supervision is a burning one. Many there are who would like to have this duty entirely taken from them, as one that is hardly, in their view, compatible with the architect's primary vocation; there are others who would considerably reduce the time expended in looking over buildings in progress, or would gladly delegate the irksome part of the work to the clerk of works. The legal view of the question is also important, and makes it very necessary to authoritatively define the limits of an architect's supervision, for, as we are aware, any failure or accident that may take place is often attributed to a want of careful inspection on his part.

We may instructively consider the subject from these several points of view, and, in the first place, we may inquire what is the meaning conveyed by the word "supervision" as an architect's duty? The word itself is liable to a very wide interpretation. Etymologically the word is derived from the Latin—*super* over, and *videre* to look at, and in plain English it means to look over any work. Superintendence means a *personal* supervision, and to this word a more careful duty attaches, as that of superintendent, inspector, or manager. The difference between these words have been recognised by the architectural profession, though both terms are often used without a difference. Apropos of this question we may point out that recently the American Institute of Architects have drawn the attention of the editors of important dictionaries to the distinction. It is pointed out that the word "supervise" is used to express the "general and intermittent oversight given by an architect with special reference to masses and main features in the manual execution in brick, stone, wood, and of the various designs which have been created from his brain on the drawing-board and in the specification"; and the word "superintend" to express "the constant and close attention to detail given, when called for under the contract, by some subordinate or clerk of works, to each structure erected from such designs." So that our trans-Atlantic brethren have already seen fit to notify this distinction in a practical manner. The word supervision is thus applied in a general way to the masses and main features of a design; the word "superintendence" to the detailed inspection of the clerk of works. In the schedule of charges published by the Institute, the expression, "general superintendence of works" is used as one of the customary duties included in the charge of 5 per cent. The "Architectural Dictionary" has no definition of the word "superintendence," and does not help us.

The term is very frequently used amongst architects—in fact, it is more common than "supervision." At all events, we know several different ideas are attached to the word "superintendence" by architects, and it may be well to determine what the profession generally mean by the duty when no clerk of works is engaged. We believe the majority of practising architects would say the duty embraced more than a general oversight with reference to masses and main features; it would include an inspection of workmanship and details as well. It would be, perhaps, beside the question we are discussing to refer to the Mediæval practice, or to the duty of architects in the last century and early in the present. The superintendence of buildings during the Middle Ages, whether it was the duty of the architect, surveyor general, or master of the work, must have been of this detailed description, though from the uncertain nature of the architect's duties in those ages, it is hard to determine with any exactness. We have, for example, a dozen of names applied to the superintendents of old English buildings, as, for instance: surveyor-general, overseer, master of the fabric, devisor, master mason, ordinator, ingeniator, &c. There is, indeed, a strong presumption in favour of the opinion that the Middle Age "architect" was the personal superintendent or "surveyor" of the works, as we know William of Wykeham was, who was appointed "survioure" or supervisor of the king's works. Reference, therefore, to the practice of past times shows that the superintendence of buildings was an essential part of the duties of those who occupied a position similar to that of the modern architect. Many of our leading architects have performed the duties of clerks of works, some of them have even worked at the bench, though to the actual value of the mechanical training we are not disposed to accord much, as the time spent in the use of tools may be more profitably devoted to the superintendence of buildings, to the knowledge of building construction, and to the routine of the office.

Before we come to consider the relation of the architect to the clerk of works—a most important question in dealing with the architect's supervision—we may for a moment inquire what kind of superintendence is expected from an architect who has not the assistance of a clerk of works? We cannot, from what has been said, agree with those in the profession who think supervision is beneath the architect's function. Such an idea would be tantamount to the assumption that an architect's duty was simply to draw designs and plans of buildings for other persons to execute. Indeed, men who have risen to eminence as architects, as well as those who understand the intimate relation between design and workmanship, must accord to supervision a very important part in architecture. To carry out the design in the building, not merely to draw it on paper, is the only realisation of the art. Less than this, it cannot be architecture. In answer to the question, What kind of supervision is necessary, we come to the practical part of our subject. Here the supervision may mean (1) the duty of the architect to see that his design is being carried out as he has shown it on paper, that its proportions are preserved, and the general design of its features carefully executed in accordance with the specification and detail drawings, the details of the work being left to the clerk of works or builder; or (2) the personal superintendence of the work not only as regards the carrying out of the design, but in the execution of the various trades. In consonance with this view of his duties of supervision the architect will inspect the setting out of the building, will see that the foundations are put in agreeably to the specification, that the concrete is properly prepared, mixed, and laid in the trenches, that the walls have footings and bond as prescribed, that the timber is of the specified quality, and, in short, that each trade is carried out in a proper manner. It will be impossible for an architect with several works in progress in different parts of the country to give the time necessary to attend to all these trades, unless he can employ a clerk of works to superintend, say, two or three of the buildings within a short distance, and apportion the expense between them. If the work is particular such a course may be desirable; but, in this case, the clerk of works is better employed solely on one building at a time. For ordinary buildings it would not pay to employ assistance, so that the labour would fall on the architect himself. To him, therefore, it is vital which of the two kinds of supervision we have indicated he is prepared to give. By accepting the larger responsibility of superintending every trade, if he can find time to do so, he has the satisfaction of knowing the work is being executed to his liking, though that may not always be for the good of the work, as that will depend on his experience and practical skill. An architect cannot be supposed to know every detail required in a complicated building, nor probably the best available method of execution in every case; he may, for example, insist on one of his details being executed so that a skilful workman or clerk of works could have modified with advantage. Our knowledge of architects in practice leads us to the conclusion that the more general view of supervision we have sketched is much more likely to be accepted for these reasons:—1. It is more practicable under the present professional standard. 2. There is less personal responsibility involved. 3. The intermittent and general supervision is less prejudicial to the building in the case of inexperienced architects. If a building is accurately set out in accordance with the plans and drawings, and the construction in its main features be made to agree with the specification, the architect's duty as supervisor may be said to be fulfilled. The late London School Board revelations have called the attention of the profession and the public to the subject of architect's supervision. It is absurd to imagine that one architect could look after the several trades engaged in numerous schools going on at the same time, though his general supervision ought to have been sufficient, with the staff under him, to have prevented any glaring omission or scamped work. It would be unreasonable to blame the architect for badly-connected drains, improper concrete foundations, the loosening of pointing to brickwork, loose and falling plastering: these things, if done as specified, could not have taken place, yet we could not expect the architect to see whether they were done in compliance or not.

When a clerk of works is employed, the architect's supervision is considerably reduced, and practically is handed over to him. We here inquire what ought to be the relationship between them. We have known much friction to ensue from the employment of a clerk of works, and the question is, To what degree should the architect consign his powers to him? Many in the profession commit the whole of their duties to the clerk of works, others retain matters that relate to design, simply engaging him to superintend. The latter principle seems to us to be the right one. We agree that the architect should, as far as possible, give his direction through the clerk of works, and should not interfere with his control except for any very strong reason. Notwithstanding this generally-admitted dictum, we know that the architect is very prone to give orders when he visits the buildings, and that much disturbance, if not ill-feeling, is thus engendered against the clerk by the foreman or builder. Altercations arise between them, or the building suffers, by the division of authority. We think, therefore, it is for the architect in each case to determine the clerk's authority, and this would depend on the ability and artistic skill of the clerk of works, his appreciation of what is good and correct in design, and his capabilities of interpreting the spirit of the architect's work. We have known clerks of works who could not be intrusted with the enlargement of drawings or details, and therefore the reproduction of a detail to

a large scale would have to be done by the architect. Generally we think the clerk of works, in addition to his proper duty of superintendence, may be required to check the plans, and see whether the figured dimensions of details agree with the full dimensions, to draw to a larger scale plans and details, especially to supply those which can only be obtained during the progress of the work, to call the architect's attention to discrepancies between the drawings and specifications, to omissions, to keep account of extras, to measure variations, to obtain day accounts for alterations, to enforce attendances upon each trade, to insure completion, to check quantities, and do other things of a technical and clerical nature to relieve the architect.

Amongst those things to which an architect may more especially direct his attention in his general supervision we would mention the following points: The setting out of the building, general examination of foundations, the width and construction of piers and openings, the construction of pillars and arches in their initial stages, all matters in which the design is important, such as the setting out of tracery and architectural details in stone, wood, and iron; in short, everything in which he desires the design to be carefully followed. If definite rules in these matters were adhered to, and the duties of architect and contractor, or architect and clerk of works, were specifically laid down, a vast amount of trouble and labour might be spared, and the public would soon learn to understand what was the extent and limit of the architect's supervision.

CHURCH ARCHITECTURE.

COMPARING recent designs of churches with those erected twenty or thirty years ago, we cannot avoid noticing the rapid strides which have been made in ecclesiastical architecture. To notice briefly some of the points of contrast presented between edifices of the period we refer to and those of the present day would carry us too far. There are many who deny that ecclesiastical architecture has been at all progressive; they declare that we are still following types of a Mediæval character, and that, compared with domestic and other secular buildings, our churches show scarcely any invention either in plan or construction. We do not contradict the assertion that our modern Anglican churches closely follow those of bygone ages in form and architectural detail; but there is an answer. Three centuries of theological strife and doctrinal diversities have not introduced to us an arrangement that suits the purpose of Christian worship better; and, strange to say, even amongst Nonconformists the traditional plan is growing more in favour, nothwithstanding the attempts made to supplant it. An architectural journal is not the place to discuss church doctrines and differences of ritual, but there is one ground of common agreement and sentiment—namely, the desire to make a building consecrated and set apart for divine worship as much as possible unlike any secular structure, in which desire we can also trace the predilections for a national style of church architecture, the growth of five centuries. The strongest evidence we have of this feeling is the greater resemblance found to exist between churches of different denominations. For many years we have noticed one by one features which distinguished the buildings erected by several important denominations, giving place to others dictated in a broader spirit. The narrowness of sectarian scruples is gradually disappearing; thus we can all remember how infrequently buildings erected for Nonconformist worship were adorned by towers and spires, how seldom the nave and aisle division entered into the plan, and how few even of the Wesleyan and Congregational buildings possessed an organ chamber. All these features are now added. The Established church has undergone very similar changes. Half a century ago numerous edifices were erected without any provision for either the clergy or the choir. There was a mere pretence for a chancel in the form of a small recess, the west gallery accommodated the choir and organ—the pulpit, the central object, attracted all eyes by its elevated position, and was placed before the altar, or, quite as ridiculous, there were two rival pulpits, one on either side, if they did not assume the objectionable "three-decker" arrangement. All these things and many more are altered in deference to the principle of putting the prayers and offices of the Church before preaching, and of returning to the old order of the Canons and Rubrics.

Confining ourselves to a few of the well-marked architectural improvements in modern church building, we may begin with the structure, and afterwards notice the details. Greater truthfulness is apparent in design, for we have fewer imitators of style. Whenever there has been imitation truthfulness has been sacrificed, and in no branch of architecture is this more manifest than in church building. If we compare the churches of the late Gilbert Scott and G. E. Street with those of the preceding age, we must observe differences. One can notice the treatment of the windows internally, the wrought-stone angles, the drop arch, the thicker tracery of the later work. The arcades of stucco, resting on stone pillars, give place to stone throughout, though the design may be plainer. So with the woodwork—it is less elaborate and moulded, but the form is more rational.

No doubt the paucity and meagreness of our post-Reformation churches are attributable to the necessity of providing cheap accommodation for the increased population. Churches were built to supply the largest amount of room at the smallest cost. The utilitarian principle was carried to an extreme limit, to the utter sacrifice of dignity and appropriate character, to which the Puritan spirit of the period of the First Charles contributed not a little. Later—early in the present century—came the desire to imitate the grander specimens of ecclesiastical architecture, and thousands were spent on building in all their elaborateness churches after such models as Bath Abbey Church and Holy Trinity, Hull, when a much more moderate expenditure would have sufficed to have furnished buildings of smaller dimensions and unambitious architecture, like the chapels which served the mother church in the larger parishes of Yorkshire. It seemed then impossible to build simply but well and appropriately. In our recently-built churches we have atoned considerably for this meagreness and the desire to copy with literal exactness which characterised the earlier work. We find local materials used instead of wrought stone or stucco imitations; the utmost plainness compatible with propriety and substantial structure is met with. For small churches ashlar is out of place; indeed, the rough, unhewn rubble or ragstone, and even pebble and brick, are more in character with a style in which simple outline and avoidance of detail are considered. This extreme plainness was not tolerated amongst certain sections of Churchmen, and even now we find those who think an ecclesiastical exterior cannot be obtained without a certain amount of detail, even at the expense of the interior, where it is more consistently introduced. It would be easy to name various fittings and decorations of churches in which the quality of simplicity has been regarded. Take, for example, woodwork and metalwork. The incessant stop-chamfering and crocket, notch, and cusped tracery in the first, and the elaborate scrolls, twists, and Brummagem ecclesiastical finery in brasswork are now nowhere seen—not even in the illustrated catalogues of high-class firms.

In regard to plan, we find a general agreement to avoid the singular, the ambitious, or Continental features. The apse and chevet have been used very sparingly by English architects, and preference has been shown for the thoroughly English square East End. So with the adoption of the central tower; noble and dignified as that situation is, it is very rarely employed in the design of parish churches. The cruciform plan also has not been so generally followed as might have been anticipated, owing probably to the infrequent use of the central tower. Other reasons have been the greater cost, and the question of seating. Nor do we find that the "domical" or "central hall" arrangement, admirable as it is for a building to hold a large congregation within sight and sound of the pulpit, has met with the encouragement at one time held out to it. The principle has been tried in several churches and chapels in which an unobstructed auditorium has been the chief aim. In proportion as this has been attained, the edifice has lost in character and the requirements of reverential worship. As an example of a plan designed on this system, we may refer to the selected design for a Congregational church at Bournemouth, where the seating is expanded by a semicircular arrangement before the pulpit by transeptal projections, the remainder of the seats being planned as usual in two blocks down the nave. The aisles are narrow and converted into passages, and the apse is entirely appropriated to the choir. The floor is raised at one end (see illustration in "B.N." for Dec. 13). The Wesleyan chapel at Helperby, Yorkshire (see illustration, March 1, 1889), shows a transeptal termination for seats. Other examples convert the bulk of the area into a large octagon before the pulpit, the apse being converted into a rostrum or choir. Both arrangements are objectionable; in the latter the domical lantern required over the octagon is costly, and the acoustics is often unsatisfactory. Mr. Sedding's design for the Church of the Holy Redeemer, Clerkenwell, adopts Wren's plan of widening the church by transepts at the east end. The plan which is generally found to give the most economical results, as well as being more in accord with church precedents is the oblong rectangle arranged on the basilican principle, with nave and aisles, a chancel of the same width as nave, and a transeptal arrangement, in which the chancel or choir forms the centre, and an organ chamber one of the transepts, which are seldom made to project beyond the aisle walls, and, if they do, but slightly. Eastward of the transepts the sanctuary alone projects. The late Mr. Street's fine church of St. John the Divine, Kennington, with its fine western tower and spire and apsidal end, and its inclined bay of nave made to converge towards the chancel, is a good example of a wide clerestoryless nave, with aisle roofs close underneath the nave roof. Grahamstown Cathedral, by Mr. J. Oldrid Scott, F.S.A., follows the same general plan; and of recently-built churches, Hornsey Parish Church, lately described by us, shows a finely-proportioned aisled church, the organ chamber and choir vestry occupying the transeptal recesses. Seating arrangements are so intimately connected with plan that in designing the latter the architect ought to have the benches in his mind's eye. In large churches the position of the pulpit ought to be fixed in relation to the mass of the congregation. If it is necessary to bring it into the nave, the seats east of it are better made chairs, so that they may be turned round during the sermon. One objection to deep transepts is the necessity of placing the seats to face north and south, thus creating an undesirable class

division in the congregation, and causing the occupants in them to face each other. The distraction caused by being brought face to face with a large section of the congregation is undesirable. In the plan we have just described this is avoided. The seating of the aisles is often left to chance. By far the best arrangement is to make them passage aisles, so that the blocks of seats may be massed together as much as possible in the centre of church. By doing this the difficulty of seeing the service, especially at the eastern ends of the aisles, is avoided. Of course, in all cases a central passage or alley is desirable, and this ought to be wider than it often is. There would then be one rectangular block of seats on each side of the church instead of two, and the comfort of the congregation is also consulted by this plan, as the objection to pew doors on each side of a narrow passage in leaving and entering is removed. But the plan is more architectural: the aisle wall, with its shafts and wall decoration, can be seen right down. The pillar-bases of arcade, instead of being inclosed by pew-framing so as to be hideous, are exposed in good plans by making them stand in recesses open on the side of aisle. In many churches the seats are planned on the principle of throwing into them every foot of space, without considering that a seat can only hold a definite number, and that the extra foot thrown in is wasted, and would be better left to give width to the passage and space to the interior. Thus, a seat 5ft. long will hold three grown-up persons, while another person could not be squeezed into it if it were a foot longer. The importance, therefore, of arranging the blocks to accommodate a certain number of people in one row is evident. In the best churches the curtained or boxed inside porches at the west end of the passages are avoided, and a narthex or clear space is left the whole width of nave and aisles, into which area the outer door opens. In many recently built churches we find this space made a prolongation of the nave, with an entrance at each side north and south, as at St. Paul's, Kensington, or it may be made a distinctly treated bay if there is no tower at the end.

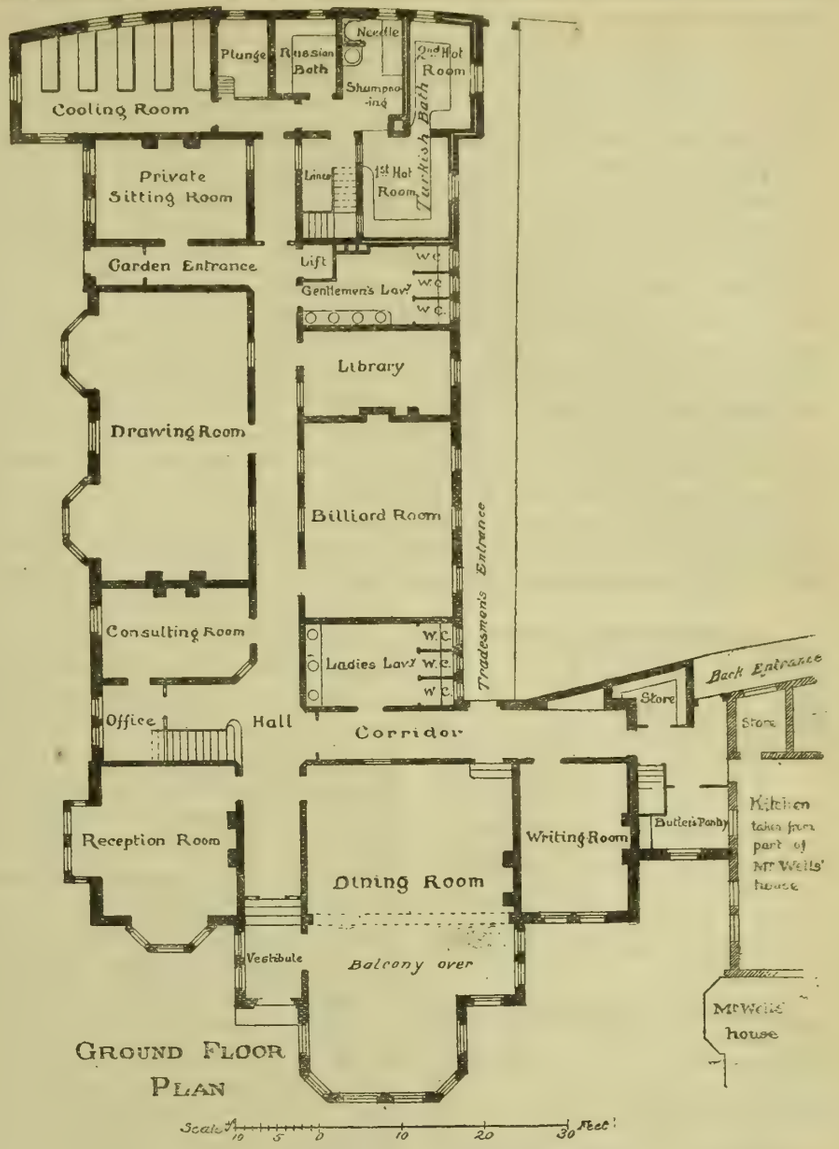
We have little space here to allude to planning of the chancel, and the furniture and fittings. In both the additional space now given to the functions of the clergy and choir, and the more appropriate and dignified treatment of the chancel and its decoration, we see a more reasonable discretion. That portion of the church once so neglected, and often used in some places as a receptacle for old hassocks, and filled with seats for children, now assumes a character more befitting its position as a sanctuary in which the highest rite of the Church is celebrated. The chancel is no longer a small chamber tacked on just wide enough for the Communion-table, it is now made the whole width of nave and of proportionate height, and its furniture and decoration are often in good taste.

THE HYDROPATHIC ESTABLISHMENT AND ITS BATHS.—IV.

By R. Owen Allsop, Architect.

(Author of "The Turkish Bath: Its Design and Construction.")

THE principle observed in arranging the bathing accommodation in the plans heretofore illustrated, has been a concentration of the baths into one group, placed in as accessible a position as possible for the visitors at the establishment. This is the general, and in the majority of instances the best, system to go upon. Experience shows that it is superfluous to place on each floor of a hydropathic, separate bath-rooms of a similar description. Such a plan is, in most cases, wasteful and extravagant, both in first



GROUND FLOOR PLAN

PROFESSOR WELLS' HYDROPATHIC ESTABLISHMENT, SCARBOROUGH.

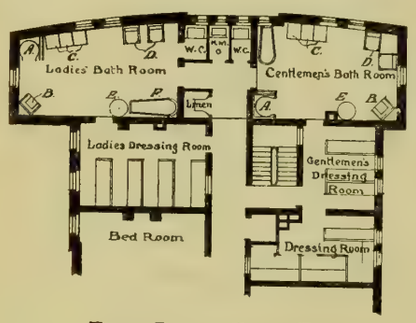
cost, in attendance, and in maintenance. At the establishment at Ben Rhydding, at Ilkley, where are many hydropathics taking advantage of the moorland air and Wharfedale scenery, and of the good supply of water, there are bath-rooms provided on every floor; but those above the ground floor are seldom, or never, used, it having been found that well-appointed douche and pack-rooms on the ground floor, combined with a Turkish and a Russian bath in the basement, are all that is requisite to supply the needs of the bathers. And in spite of isolated instances to the contrary, it has been found best thus to concentrate the bathing accommodation of the hydropathic, grouping together, either in a basement, or preferably, on the ground floor, the various bath-rooms, rendering the baths thus formed convenient of access for visitors and patients.

This principle of concentration of bathing accommodation pertains at Smedley's, and at the many smaller hydropathics at Matlock that have grown up in the shadow of the big institution. It is to be found, as pointed out above, at Ben Rhydding, and in most, if not all, the establishments at Ilkley, including the extensive one known as "Craiglands" and the "Wells House." It has been adopted at Professor Lomas's excellent hydropathic at Buxton—"Malvern House," and at the well-appointed "Peak House," where Dr. Hyde is the consulting physician. It is employed at Dr. Banning's beautiful establishment at Bushey, Herts; at Sudbrook, Richmond; and at the Farnborough Pine-Therapeutic Establishment in Hants; and in more hydropathics in this country than it would be possible to name here, since it is only the few that adopt any other plan. It is the principle observed in the design of the majority of the Scotch establishments. And it is the system followed generally on the Continent, whether in the thermal-cure establishments in France or those of the spas of Germany. The desireability of thus grouping the baths of hydropathics, I pointed out in the concluding chapter of "The Turkish Bath: its Design and Construction," when speaking of the arrangement of the baths at the Hotel Mont Dore, at Bournemouth.* In the opening remarks in that article I showed how it was necessary and desirable to group the various baths, so that a patient might undergo treatment comprehending various baths, and that without having to pass from one part of the building to another.

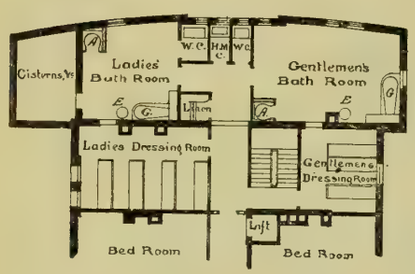
Where, however, the bath-rooms of each set are complete in themselves, it may become perfectly practical to have bathing accommodation on two or three different floors. If, as in the plans here given, of Professor Wells's very complete establishment at Scarborough, the various suites of bath-rooms be superimposed one above the

* See Building News, April 19, 1889, pp. 536-7.

other, and rendered convenient of access by proximity to a lift and staircase, the arrangement may be found to be practically as convenient as can be desired. Here each suite of rooms is self-contained, complete in itself, and each is devoted to its particular purposes. There are the sudorific appliances—the Turkish and Russian baths—on the ground floor; the more strictly hydropathic, or "water-cure" baths—the sitz, douche, &c.—on the first floor; and electric baths on the second floor. The plans given herewith, which I am enabled to put before the reader through the kindness of Mr. J. Caleb Petch, architect, of Scarborough, to whom the design of the building is due, show the nature of accommodation, not only of the baths, but of the residential portions of the establishment. This latter comprises vestibule, office, spacious drawing and dining-rooms, reception-room, billiard-room, library, writing-room, consulting-room, lavatory, &c., and a private sitting-room. The upper floors are devoted to bedrooms, &c., and seven private sitting-rooms over and above the one on the ground floor; and, it being contemplated to transfer the business to a limited liability company, plans have been



First Floor Bath Rooms



Second Floor Bath Rooms



prepared for extensive additions. The establishment is erected adjoining the proprietor's private residence, out of a portion of which the kitchen, &c., were constructed. At the end of the main corridor is the entrance to the Turkish bath, consisting of cooling-room, plunge bath, shampooing and washing-rooms, and two hot-rooms. Between the shampooing-room and the plunge, is arranged the Russian bath, thus conveniently placed so that it may be used, if desirable, in conjunction with the bath of dry, hot air, and so that the same shampooing and washing-room may be used for both baths.*

The baths on the floors above are arranged at the same end of corridor. The suite of bath-rooms on the first floor comprise ladies' bathroom and dressing-room, and gentlemen's bathroom and dressing-room, the accommodation being very similar on the second floor. The combination baths, marked A (see plan), comprise rising douche, descending douche, shower, needle, and spinal douche; those marked B comprise sitz, wave, spray, and rising douche. Each of the baths at A and B may be given either hot, cold, or of graduated temperature. Baths marked C are hip and foot baths; those marked D are portable vapour or "steam" baths; those marked E are ordinary hot and cold douche and spray; those marked F are shallow baths; and G G indicate electric baths.

Of the nature of the above and other hydropathic baths I shall speak in a future chapter. For the moment we are engaged in considering the general arrangements of a hydropathic establishment. The daily life of patients in such buildings must be fully understood before any attempt is made to plan them. Mere visitors live in the hydropathic much as they would in the hotel, only they must conform to the rules and regulations of the establishment. Patients in the hands of the consulting physician, however, live a life of daily routine. At stated hours they must undergo "treatment" according to the doctor's prescription, and when it is remembered that this may mean withdrawing to the bath-rooms thrice a day, with a longer or shorter stay therein, as the nature of the baths taken may require, it becomes evident that the means of approach to the baths, the distance to be traversed, and the accommodation of the suites of bath-rooms are matters meriting the first attention of the architect. In theory it may be all very well for the hydropathic practitioner to argue that the system of treatment necessitates the abandonment of all luxurious living, and that therefore a rough bath-house in the grounds of the establishment will meet all needs. In practice, should any one act upon this belief in the 19th century, he will be doomed to failure—unfortunately, I may say, as such a one is to be commended for his protest against the over-luxuriousness of the age. But there is a mistaken idea in connection with this "muscular" hydropathy. It was the delusion of the early apostles of the "cold-water cure." On their system the few strong constitutions that have become diseased through errors in living might be saved from ruin. But the vast number of diseases—the ailments of the mass of humanity—reqnire a treatment that shall be mild, gradual, and gentle in its action, in manner similar to that which we should bestow upon the frail and delicate plant. It behoves us, then, to see that comfort and convenience in the placing and arrangement of the bath-houses be carefully studied. The inhabitants of the hydropathic should be able to approach the baths with exactly the same degree of comfort that they will pass from the dining to the drawing-room. Draughty passages and chilly corridors must be avoided, or where we cure we make ill again. Such attentions and considerations the majority of patients require; and as for the vigorous treatment and the Spartan living that best suit the plethoric, hot-blooded, and over-fed, it is all comprised in the regular application of the 2in. cold douche falling a distance of 20ft.

Effectiveness in action should be our first consideration; but, having attained that quality, it is necessary to continue our studies till comfort is added, and convenience gained. Then comes the question of rendering the useful pleasant and attractive to the eye—the last to be considered, but the first to repay us. The hydropathist, in arranging, unaided, the bathing accommodation of his establishment, stops at effectiveness of action; the architect should prove to him the benefit that will accrue to his cause by that study of comfort, convenience, and appearance for which the public are ever grateful. Wise study of refinement in baths and bathing attracts the cultivated Englishman just as certainly as rough-and-ready and improvised arrangements repel him, and cause him to regard hydropathy with wholly unmerited disgust.

(*To be continued.*)

† Mr. Petch writes me that the heating of the Turkish bath is effected by means of a furnace of firebrick, with a flue of strong sheet iron carried under the lattice seats in the hottest room, the fresh air being admitted over the heated flues, and the vitiated air escaping in the ordinary way at the floor level.

MASONRY AND STONE-CUTTING.*

By Lawrence Harvey.

[TWENTY-SIXTH LESSON.]

SKEW RAKING VAULT INTERSECTING HORIZONTAL BARREL VAULT.

LET A L M B (Fig. 164) be the face-arch placed in the elevation plane of our drawing. Let E G, A C, B D, F H be the horizontal projections of the two raking imposts of the vault. The jambs of the arch not being at right-angles with the wall-face, the arch is therefore skew.

Let G H be the springing line of the horizontal barrel vault, and let it be at the level of the plane of our plan, in which arrangement we should have drawn A B of the elevation at a height, E *e*, above the ground line; but as the projections required for the working of the stone will not be on this elevation, we keep it down at the lower level in order to render the drawing more compact.

Let the bed-joints be planes taken through the radii O L, O M, . . . and through the corresponding generators of the cylindrical soffit, although these planes are not normal to the intrados.

Now select a new vertical projection plane parallel to the sides of the oblique arch, and make thereon another elevation. Let E X (Fig. 166) be the ground line of that new elevation plane, and place above it the springing line E′ F′ of the arch at its proper level = E E. Then E′ G, A′ C′, B′ D′, F′ H′ will be the elevation of the raking imposts of the arch. To draw the joint-line starting from L, project I in I′ (Fig. 166), then make I′ L′ = I L. From the point L′ thus found draw L′ L″ parallel to E′ G. All the other arrises of the stones are drawn in the same way. In the new elevation of the face arch the joint lines N′ L′, P′ M′ prolonged must pass through O′.

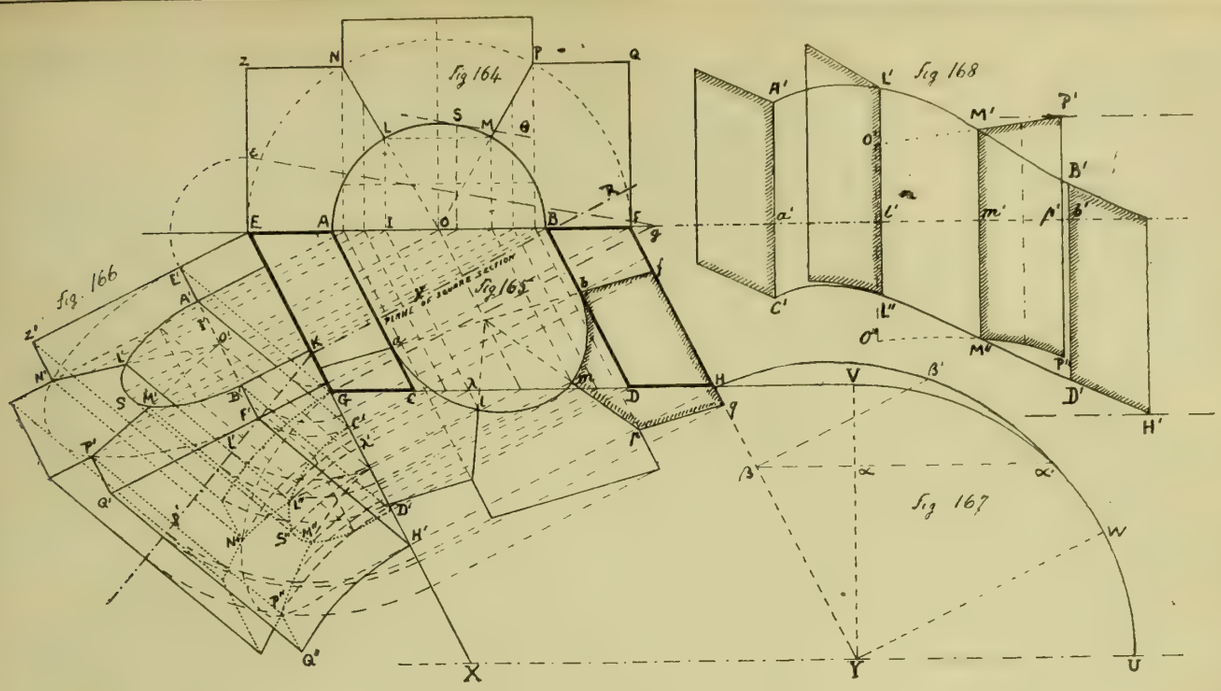
To find the points where the joint lines L′ L″, M′ M″, . . , cut the soffit of the barrel vault, draw X Y centre line of that vault; cut the vault by two vertical planes Y V, Y H, the one perpendicular to X Y, the other parallel to the sides of the raking arch. The first section will be the circle U V; the second is an ellipse, which, laid down on the drawing round the line Y H takes the position H β' W. This elliptical section can be delineated as follows: Cut the vault by a vertical plane parallel to its centre line, it will give a horizontal line; the level of that line is $\alpha\,\alpha'$ in the square section, it is therefore the same for $\beta\,\beta'$ in the elliptical section.

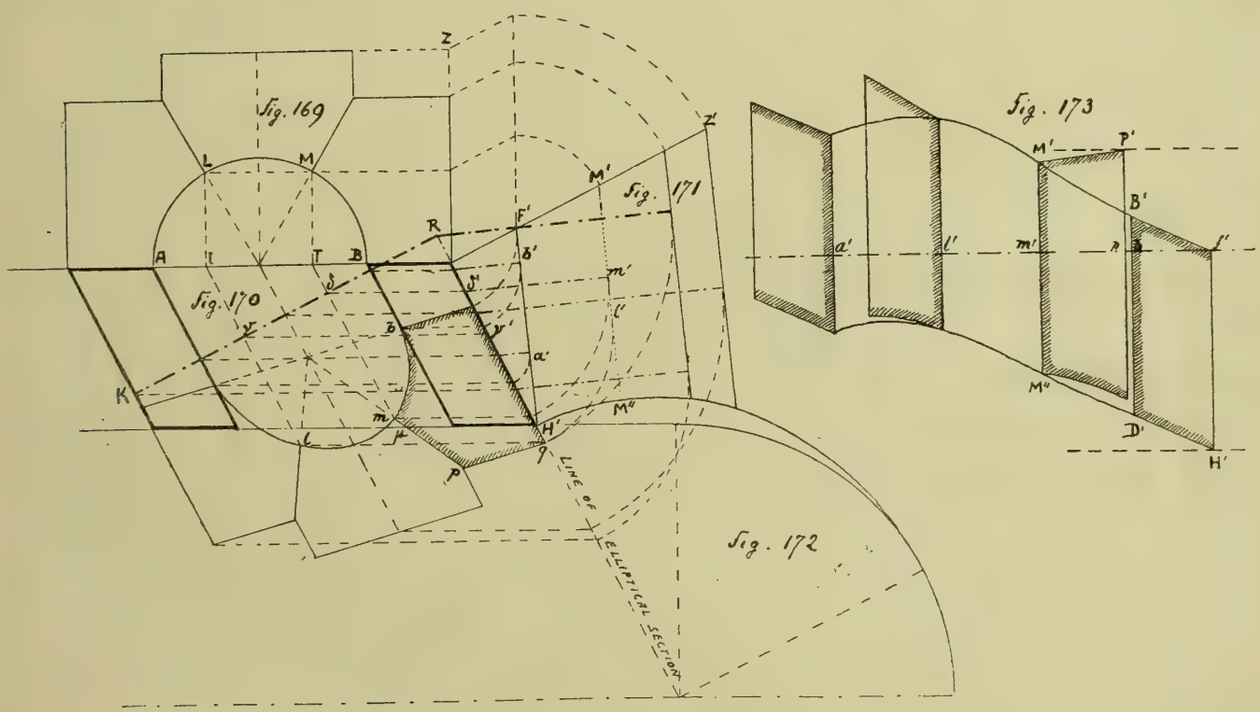
Once the elliptical section is drawn, cut it out in cardboard or zinc; then if you were to place it in the structure vertically on the line I γ (Fig. 165), with its foot λ on the springing line, the cardboard section would necessarily cut the joint starting from L. We draw this operation on the elevation (Fig. 166) by laying the cardboard section on that elevation with the bottom of the section in λ' and its ground line H Y coinciding with λ' X. Where the section meets, L′ L″ gives the point of intersection L″. The same operation will give every other point of the intersection of the raking arch with the soffit of the barrel vault. The bedjoints N″ L″ and P″ M″ are arcs of ellipses, and may be delineated by finding, by the same method, intermediary points between the two extremities.†

To develop the soffit of the arch we require the square section. To find the square section, cut the raking arch by the plane F′ K R (Figs. 166, 165) at right angles with the generators of the arch. This plane will cut the joint line (L′ L″, I λ) in a point the elevation of which is l', and which is placed in a vertical plane of which I λ is the trace. When we turn down the section round K R, the horizontal trace of the section plane, the point will come in l on the line I λ, and the distance of l to the hinge of rotation is equal to K l' (Fig. 166). Thus all points of the square section can be found. The

* All rights reserved.

† To obtain the line S′ S″ tangent to the curves of the face arch and groin, take a plane tangent to the cylinder and perpendicular to the second elevation plane. To do this, draw G g perpendicular to E X, and take a plane through the lines G g and G E′, the vertical trace of that plane (Fig. 164) is $e\,g$. Draw tangent S θ parallel to $e\,g$, S is the point from which the required generator will start.





section of the right-hand arch stone which we shall consider in the cutting is *b m p q f*.

Soffit and Bed Moulds.—On any straight line (Fig. 168) carry the distances *a' l'*, *l' m'*, *m' b'*, equal to the arcs *a l*, *l m*, *m b* of the square section; then draw, at right angles with the base line, the lines *a'* A' and *a'* C', *l'* L' and *l'* L'', *m'* M' and *m'* M'', *b'* B' and *b'* D', respectively, equal to the lines of the same name on Fig. 166. Then draw the curves A' L' M' B' and C' L'' M'' D', which are the outlines of the developed soffit, and which give you the soffit-moulds. For the bed-moulds, take *m' p'*, equal to *m p* of the square section, and make *p'* P' and *p'* P'' equal to the same lines on Fig. 166. The side M' P' will be straight; the side M' P'' will be a portion of an ellipse, the curve of which can be delineated by a few supplementary points found by the same method. We can also turn down the centre line for each bed, and get the points O' and O'' where the joint lines would pass if prolonged. We see in this drawing also that the greatest length of the right-hand stone is contained between the dotted lines starting from P' and H'.

Working the Stones.—The safest way is to cut first a prism having the square section for its base, and of the length of the stone as shown in Fig. 168. Then by applying on that prism the several moulds found, the outline of the stone is delineated. The wall face is easily worked to a plane. The cylindrical face belonging to the soffit of the barrel vault is worked with a straight-edge, guided by marks easily obtainable from our drawing, and then placed on the stone.

Second and Shorter Method of doing the same Problem.—In the former method we have used the usual orthagonal projections; in this one we take the second elevation plane on F H (Fig. 170), and we project the raking arch thereon parallelly to the generators of the barrel vault. Then all the joint lines are limited on one side by the straight line F' Z', which represents the wall face, and on the other side by the elliptical section of the barrel vault.

To find the square section, cut the raking arch by the plane, F' R K, perpendicular to the generators of the arch. This plane will cut the joint line M in a point situated in the vertical plane, Tμ. When the section is turned down, the point of intersection, *m*, will come somewhere on that line. The distance of that point to the hinge of rotation is equal to that of a line drawn at right angles from δ to the joint line M. The elevation of δ is δ' (Fig. 171); the length required is therefore $\delta' m'$, which, carried from δ, gives us *m* of the square section. Thus all other points of the square section are found.

For the soffit and the bed moulds, the developments are made on the same principle used in the former method; but we must remember that the distances to be carried are *a'* F' and *a'* H', *l'* M' and *l'* M'', *m'* M' and *m'* M'', *b'* F' and *b'* H of Fig. 171. The stones are worked as before.

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ILLUSTRATIONS.

SELECTED DESIGN FOR THE FREE NORTH CHURCH, INVERNESS.—WOOLWICH POLYTECHNIC YOUNG MEN'S CHRISTIAN INSTITUTE.—TANGLEY, BERKSHIRE.—SHOPS AND RESIDENCES, SHAFTESBURY AVENUE.—A DOCTOR'S HOUSE FOR A COUNTRY TOWN.—ST. PETER'S CHURCH, RUDDINGTON. —SKETCHES AT CANTERBURY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

SELECTED DESIGN FOR THE FREE NORTH CHURCH, INVERNESS.

In response to the invitation of the committee seven competitive designs were lodged, and the design submitted by Messrs. Ross and Macbeth, Inverness, was accepted, for the new church proposed to be erected for the Free North congregation, Inverness, on the ground lying between Church-street and the river Ness, at present occupied by the manse and garden. The buildings have been planned to fill the available space, which is of irregular shape, and are arranged in a simple and uniform plan, and throughout the floors have all been kept on the same level. The accommodation provided is, church to contain sittings for 1,300 to 1,400, and minister's vestry, with private lavatory and cloak-room; session room, retiring room, with private lavatory attached, public cloak-room, hall to accommodate 355, and public lavatory, heating chamber, &c. The cost of the church is estimated at £5,500, and the tower £1,450, making a total cost of £6,950.

WOOLWICH POLYTECHNIC YOUNG MEN'S CHRISTIAN INSTITUTE.

This building has been designed to meet the great need of such an institution in Woolwich, and it is believed that it will be of the greatest benefit to the thousands of young men employed in this great centre of military industry. The site is a very commanding one, on rising ground at the junction of Mill-lane and New-road. The view shows the side next Mill-lane. The falls of the land, both longitudinally and transversely, have very largely influenced the plan. The apartments which are above the ground on the Mill-lane side are below it on the other side. The principal entrance is in Mill-lane, and leads directly up to the ground or principal floor. This arrangement enables two officials to have complete control of all who enter or leave the building. The plans explain themselves. The lavatories, private baths, w.c.'s, &c., and all the workshops are placed in the basement and sub-basement. A lift for coals and heavy goods is provided in the well of the principal staircase, from the sub-basement to the top of the building. A large gymnasium is provided in the basement, the greater portion of it extending up into the ground floor, and with a good locker-room for the use of members. A store for work in progress is provided in connection with the carpenter's shop. A large swimming-bath is provided at the upper end of site, completely fitted up in all respects, and with a gallery running round over the dressing-boxes. A large coffee-room is provided on the ground floor, with a service lift up to the kitchen on the second floor. The large hall is on the first floor. It has a gallery at one end, and will seat about 700. A private staircase is provided at the platform end, to be used as an additional exit in case of need. The kitchen, &c., and the caretaker's rooms are on the second floor, and a large art school and a chemical laboratory are provided on the third floor. All the principal floors and the corridors and staircases will be of fireproof construction. All apartments that are not joisted will have solid wood-block floors. The whole of the internal joinery will be of pitch-pine. The exterior will be faced with picked stocks, with red brick strings, cornices, and dressings, and with plinth of blue Staffordshire bricks. The erection of the building has been delayed owing to want of funds, but it is hoped that it may be commenced before long. The architect is Mr. W. Gillbee Scott, A.R.I.B.A., 25, Bedford-row, London, W.C.

TANGLEY, BERKSHIRE.

The recent additions to the above have been carried out in a style similar to the oldest portions of the house, shown lighter on plan. The ground-floor story is in red brick, and the upper story partly in tile hanging and partly in half-timber work. The roofs are covered with brown Broseley tiles. The works have been carried out by Messrs. J. Bottrill and Son, of Reading, from designs and under the superintendence of Messrs. Charles Smith and Son, architects, of the same town.

SHOPS AND RESIDENCES, SHAFTESBURY-AVENUE, W.

The block of buildings shown in this illustration is divided into nine separate houses, each containing shop, basement, and six rooms over, the latter approached by a private doorway from the Avenue. In the rear, Dansey-yard runs the whole length of the site, and the back elevation has been dwarfed very considerably on account of claims for ancient lights being made by the opposite owners. The materials used are red bricks and Bath stone. The plans were prepared by Messrs. Martin and Purchase, architects, of 11, Queen Victoria-street, E.C., and the works have been carried out under their superintendence by Mr. C. Wright, contractor, of Cantley-avenue, Clapham Common.

"BUILDING NEWS" DESIGNING CLUB: A DOCTOR'S HOUSE FOR A COUNTRY TOWN.

For description see page 890.

ST. PETER'S CHURCH, RUDDINGTON, NEAR NOTTINGHAM.

This church takes the place of one removed, the tower and spire being the only part of the old building retained. Since the view was made a new belfry has been added, and the old spire rebuilt upon it, as shown in the geometrical drawing. The materials were, for the exterior walling Coxbench stone, and for the interior lining Bath stone. The dado, screens, stalls, and altar are of oak, richly traceried and carved. The altar has a stone top, and in niches in the front figures of St. John, Melchizedec, St. Peter, and Aaron, carved by Mr. Millsom, of Manchester. There is a beautifully-embroidered dossal above the altar, the work of the Sisters of Bethany. The roofs are of timber covered with slates, and the ceiling over the chancel is decorated in colour, with archangels and angels nearly life-size. The floor of the nave and aisles is of wood blocks, with the passages and that of the chancel of Hopton-wood stone in 12in. squares. The east window illustrates the History of the Priesthood. Messrs. Williams and Co., of London, supplied the casements and glazing. Messrs. Bell and Roper were the architects.

The Bishop of Bath and Wells was presented on the 21st inst. with his portrait, painted by Mr. Richmond, R.A. The portrait will be hung in the town hall at Wells, and is the outcome of a subscription in commemoration of the bishop's golden wedding.

The London School Board resumed at its last meeting the debate on the proposal to have an independent examination of all the buildings erected by them. An amendment to refer the matter to the Works Committee as an open question was negatived by a large majority, and the debate was further adjourned. At the same meeting Mr. W. S. Cooke was elected surveyor to the Board at a salary of £500 a year, he being required to give his whole service to the board.

The first of a series of four meetings of examinees and students of the Surveyors' Institution to be held during the present session will take place in the lecture-hall of the Institution on Monday, January 13th, when a paper will be read by Mr. R. G. Hansell, entitled "Hints on the Inspection of House Property." The chair will be taken at seven o'clock by the president of the institution.

SKETCHES AT CANTERBURY.

The centre sketch in this group is the church at St. Peter's, a village situated a short way out of Canterbury. The sketches of Canterbury proper surround this view. To commence with the crypt. In 1561 the whole of the crypt was given up by Elizabeth to the French and Flemish Refugees. Here they erected their silk looms, and worked and dwelt, using the south side aisles for their services. Their descendants still continue to meet and hold services in their native tongue, though the looms have long since disappeared. The portion shown is probably the work of William of Sens.

The priory exhibits throughout traces of the great Benedictine Monastery, founded by Augustine, and confirmed by Lanfranc. One view shows the remains of the Infirmary, with its church seen through an archway, the stoup being on the right of the doorway on entering.

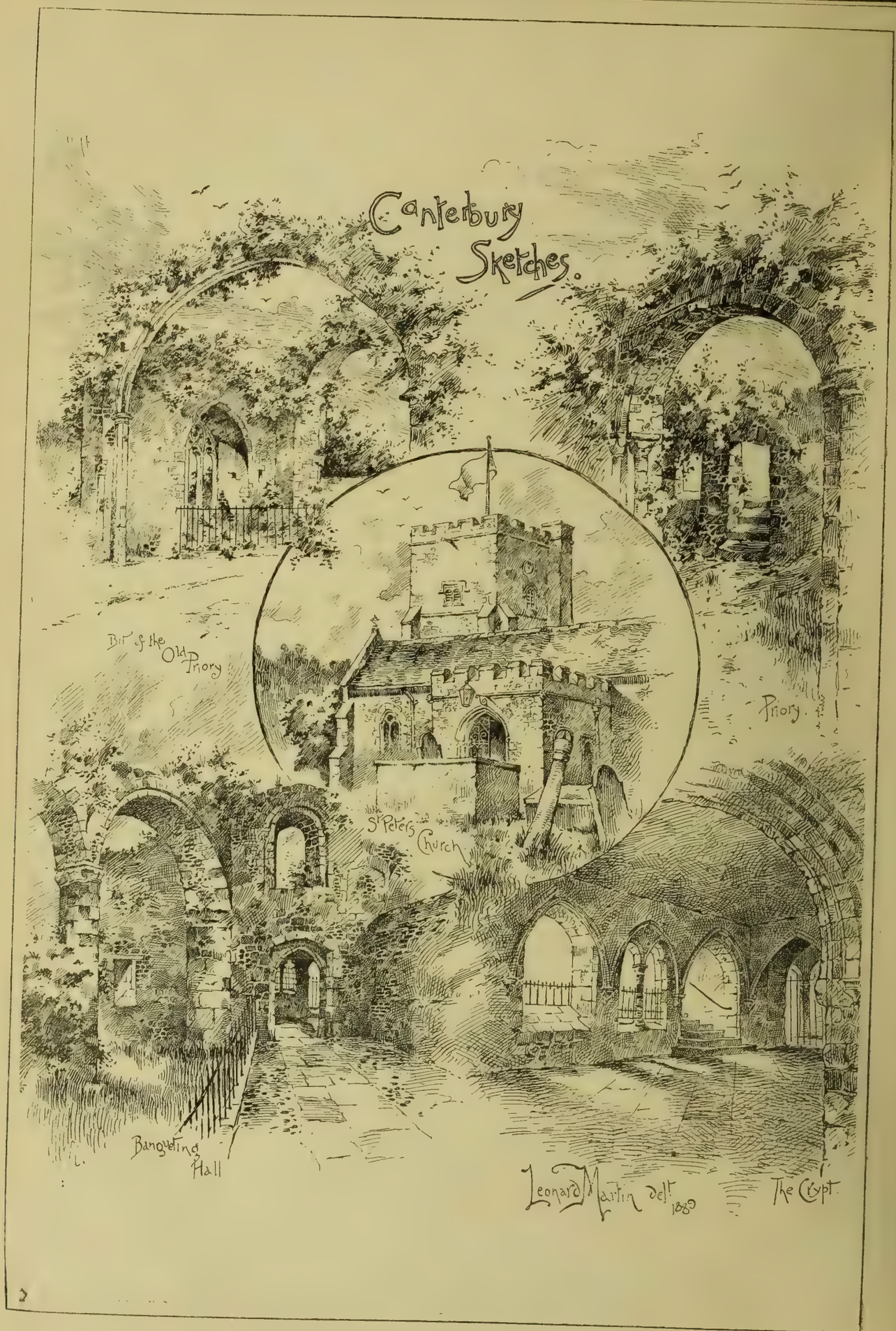
Another view, of the so-called Banqueting Hall, shows the passage known as the "Dark Entry," leading on one side into the cloisters, on the other into the Green Court. Portions of this entry are Norman, and are believed to be the work of Prior Wibert (died 1167). A staircase on the right-hand (in the entry going towards the Green Court) leads to the chapter library, in which are many rare books and manuscripts, the most remarkable being the Charter of Eadred (A.D. 947), giving the minster built at Reculver to the Monastery of Christ Church, Canterbury. On the right is the garden wall of the house, forming part of the Honours or Maister Honours, a set of state chambers belonging to the prior, and used on occasions of special dignity. Pilgrims of high rank were once lodged there. The ruins of the dormitories, refectory or "fratery," with the kitchens and cellarer's lodgings, are on the south side of the Green Court. Leonard Martin.

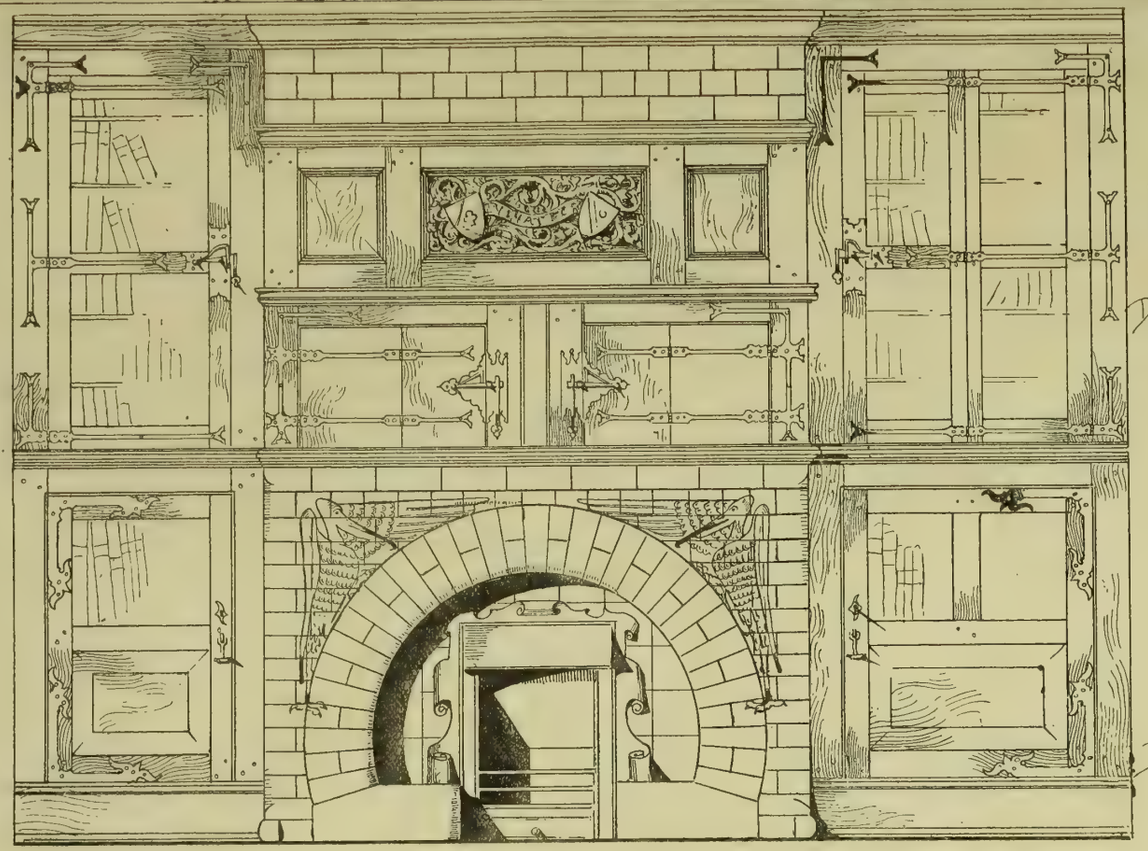
COMPETITIONS.

Blackburn.—In a limited competition, the designs of Mr. Fredk. W. Dixon, architect, of Oldham, have been selected for the rebuilding of Zion Chapel, Montague-street, Blackburn. The present chapel was erected in 1837, and has now become inadequate for their requirements. The new building will be on the amphitheatre plan.

Burnley.—A special meeting of the Burnley School Board was held on Thursday, the 19th inst., when the report of the assessors, Messrs. W. Waddington and Sons, on the competitive plans for the proposed board school in Burnley Wood, were considered. A resolution was passed accepting their award, and it was decided that the premiums be given as recommended:—first, £30, Mr. G. T. Lawrence, 20, John-street, Adelphi, London, W.C.; second, £20, Messrs. Smith, Woodhouse, and Willoughby, of 100, King-street, Manchester; and third, £10, Thomas Bell, 14, Grimshaw-street, Burnley, and Nelson. The first prize will merge into the commission if the architect carries out the work. The question was referred to the Building Committee to seek an interview with Mr. Lawrence with the view of seeing if an arrangement could be made with him to carry out his design. The plans of Mr. Bell, who takes the third premium, have been accepted by the board for a board school in Abel-street, tenders for which will be opened a fortnight hence.

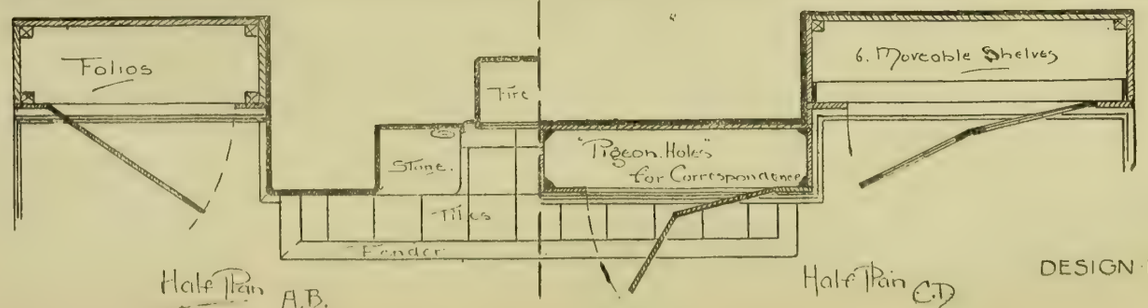
Swansea Markets.—At the last meeting of the Swansea town council a report was presented by the Market Committee recommending that £52 10s., the premium offered for the selected design for new market buildings, be paid to Messrs. Buckley Wilson and G. Moxham, the authors of the design marked "Prosperity," and that £26 5s. be paid to Mr. Alex. Graham, the adjudicator on the designs. The committee directed the surveyor to confer with the authors of the selected design as to a rearrangement and improvement of the interior of the proposed new buildings, and with a view to the work being carried out at a cost not exceeding £17,000. Mr. Tutton strongly objected to paying the premium, on the ground that the designs had not satisfied the requirement that the cost should be not more than £17,000. Mr. Mayne moved that the latter recommendation be referred back, on the ground that they would, by passing it, be committing themselves to further expense, if not to the actual employment of the firm. The amendment was carried.


Canterbury Sketches.
Bit of the Old Priory
St Peters Church
Priory.
Banqueting Hall
Leonard Martin delt 1889
The Crypt



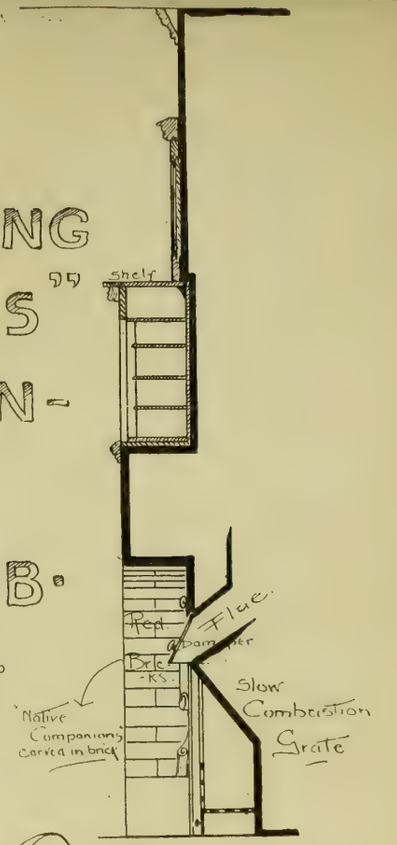
Elevation

Scale of 12 6 0 1 2 3 4 5 6 7 8 9 10 11 12 feet



"BUILDING NEWS" DESIGNING CLUB.

NOV. 89.



A Study. Chimneypiece.

Materials Walnut, with Lacquered Brass Furniture. Purpose-made Bricks. White Tiles and hammered Iron Grate.

Design by "Wallaby."

DESIGN PLACED FIRST

WAYSIDE NOTES.

In their methods of arranging financial questions relating to Metropolitan Street Improvements, the London County Council are disposed to work on somewhat different lines to those that guided the late Board of Works. First of all, there is apparent a disinclination to subscribe to the cost of improvements in the City; then we have an adoption of a principle that would throw half the burden of forming new and improved thoroughfares upon the owners of premises abutting upon the thoroughfare to be improved. Naturally enough, both the omission and the commission prove to be shoes that pinch in certain places. The City feels that it should be entitled to such consideration and substantial assistance as it enjoyed in old M. B. W. days, and the property owners whose premises are affected by alterations and improvements argue that, inasmuch as the new works are mainly undertaken with a view of benefiting London traffic, it is, therefore, unfair to burden them with any large share of the cost. The one party desires to receive money on credit, and the other objects to paying cash in advance for doubtful value received. Now, so far as I can understand the first of these two questions—the contribution to City improvements—it seems but just that the County Council should continue to bestow *largesse* upon the City whenever the proposed works are of such a nature as to be to the benefit of the whole of London; but if the proposed improvements that have been the subject of some correspondence between the County Council and the Commissioners of Sewers are of a kind that will be a boon and a blessing to only a small portion of London citizens, then, surely, the refusal to contribute funds is amply justified.

As regards the other matter, which has caused so much correspondence in the *Times*—the burdening of property-owners between St. Mary-le-Strand and St. Clement Danes with a half-share of the cost of the long-needed improvements to be effected in that portion of the Strand comprised between the two churches—it would seem in theory only right and proper that such contributions towards the cost of works should be made. But in cases like these it is necessary to consider the present condition and nature of the thoroughfare in question. There are some streets where it would be difficult to see what benefit would accrue to businesses carried on in the buildings lining its side-walks, even if a wholesale widening operation were carried out. So much foot and vehicular traffic passes through it as it stands, and the same amount will pass through it when improved. The only benefit in such a case would seem to be the gaining of a little more elbow-room for persons on the side-walks, who thus might be led to more freely patronise the shops. On the other hand, one can imagine cases where a wretched by-street is converted into a main thoroughfare, traffic being diverted thereto. In such cases the properties lining the new street must benefit enormously. Charing Cross-road and Shaftesbury-avenue are cases in point, wretched hovels being suddenly placed in commanding positions. Viewing the Strand improvement scheme in this way, we find the conditions differ considerably from either of the above examples. Although only a desultory foot-traffic passes along Holywell-street, the properties on the north side of this thoroughfare, and on the South side of the Strand must benefit to a small extent from the demolition of other properties and the disappearance from competition of their businesses. Then, perhaps, the improvements creating, as they undoubtedly will, an attractive and handsome roadway, foot traffic will be increased, or rather, people will not be tempted to hurry through this portion of the Strand, as they do in its present narrow state. It does not appear to me that these benefits, however, are such as to warrant the proposed charges being made. A smaller share of the cost would be more suitable to the occasion, for it should be remembered that it is not every business, even of a shop, that will feel the small benefit that I have suggested may accrue.

Those who remember the manner in which the County Council decided to include the "betterment" clause in the Bill for the Strand Improvements will think that this question of charging adjoining owners in cases of street improvements should receive very deliberate consideration, since it is a matter affecting every future Metropolitan street improvement that the municipal authorities may take in hand. Some more perfected system should be arranged than the rough halving of the cost. In many cases property-owners ought to pay nearly all the cost, and in others a very small percentage only.

The proposed amendment of the Metropolitan Building Acts having become definitely shaped, we are able to criticise the several clauses. The first of the twelve is one of a welcome class, calculated to assist in preserving the maximum of street and open roadway to the minimum of buildings. No. 3 amendment may help to prevent future frontage scandals—that is to say, if it does not make matters worse than before. The cause of past trouble in street alignment has been feebleness on the part of authorities, and to allow appeal from the supervising architect's decision would seem to be the wrong way to go to work to prevent fresh annoyances. It would appear that what is required would be a line of frontage maintained with an iron firmness. No. 5 is an amendment of the nature to which I alluded as likely to frustrate the jerry-builder's little games. Seeing that the average Englishman has plaster around him and plaster above him in the apartments of his domicile, the importance of enforcing sound and hygienic work seems self-evident. No. 9 I consider may prove a drastic amendment if it gives power to the supervising architect to checkmate the efforts of those who, while erecting a decent façade to the main street, render the flank of the building facing a side street a hideous eyesore. I have hopes of this amendment of the Metropolitan Building Acts. Of No. 12 I have also hopes, that it may be "the beginning of the end" of sky-scrapers and the like. On the whole the amendments are very modest, being scarcely of that embracing nature I had anticipated for them. Still, they are encouraging in their way, and may be taken as an earnest of future endeavours on the part of the County Council to raise the standard of building in the Metropolis, and to remove the impression that periodically holds one, that here in London our building regulations are far behind the times. Some day, we may hope, a bold effort will be made to rearrange the whole of our laws relating to building, putting them in a concise form, and removing that air of diffuseness for which they are mainly remarkable. This, perhaps, is rather a vain hope, so long as English law continues to be a maze and labyrinth. Still, in the case of building by-laws there exists a real necessity for a complete reconsideration and revision. It has been demonstrated by failures in buildings which in no wise contravene by-laws, that there are rules and regulations the reason of which has never been established on any scientific basis. Even in the matter of thickness of walls we find that there is needed a revision of the present tables, as failures have resulted, albeit that the construction was in harmony both with the spirit and letter of the by-laws.

There is yet a good deal of truth in the statement often made, that it is not so much new laws that we require, as the rigid enforcement of existing ones. Whilst district surveyors and rural surveyors, and surveyors to urban authorities continue to receive such feeble support whenever they are forced to bring matters before the exponents of the law of the land, we can hope for little severity against the jerry-builder. I sincerely hope that many of your readers are keeping that eye, as recommended, upon your "Legal Intelligence," as I am sure that before long they will think with me that the retribution meeted out to those convicted of constructing disgracefully unsound buildings is often absurdly light, and calculated rather to encourage than to check shoddy building.

"Ratepayer" writes me from Guildford an interesting letter touching upon the doings of the Guildford Town Council in connection with their proposed drainage scheme; but "R." will pardon my saying that inasmuch as he submits no evidence of good faith, I am unable to put before readers the whole of the facts he mentions. I must say, however, that the Guildford councillors are a peculiar body of men, when they come to deal with drainage matters—each wants one thing different from his fellows, and of concord and harmonious agreement there is none. And I must say that Mr. Lailey, the engineer of the sewerage works at Acton, has come in for a good baiting at the hands of these redoubtable town councillors. He appears to have been treated most unfairly; for his system had long ago been recommended by the Drainage Committee, who have visited Acton several times; and it does look very much as if the reason of all the annoyance he is being caused is traceable to a desire on the part of the Guildford Town Councillors to get in their own man, or men, for the job. Mr. Lailey, I should say, has much cause for complaint as to the treatment he is receiving.

Much opposition is being made to the proposed railway, or railways—for I believe two superimposed tunnels have been suggested—under Oxford-street. Those who remember the condition of Cannon-street during the completion of the inner circle extension of the District Railway will scarcely exhibit surprise at this. The tottering aspect of many of the older brick buildings is doubtless impressed upon the memory of shopkeepers and property-owners in Oxford-street, who do not desire the chance of seeing their own buildings in a like condition.

There would be some good business for engineers if the whole of the undertakings set forth in the year's total of Bills submitted for the consideration of Parliament were to pass that ordeal satisfactorily and develop into actual works. The fact is, however, that, like jobs and the architect, a large percentage of schemes never get farther than the paper on which they are drawn and planned. Many of those published in the yearly list are old ideas in a new form. Some are a mere resuscitation of half-dead Bills put forward year by year. And the gauntlet that few can safely run is the getting of funds from the public. Still, although we are compelled to discount so much, there seems much solid work ahead of the constructing professions. That this may indeed be so is my sincere wish; and to serious constructors—the engineers, and to fanciful constructors—the architects, their assistants, pupils, contractors, and workmen, I trust that the succeeding twelve months may prove very happy and vastly prosperous.

Goth.

CHIPS.

At a meeting just held it has been decided that the Mackonochie memorial is to take the form of a new high altar to be erected in St. Alban's, Holborn, and the cost is stated to be £1,000. A memorial cross is to be erected on the spot in Scotland where the body of Mr. Mackonochie was found, and another at the head of the loch where he was last seen alive. This latter is to cost £150, and £200 is to be spent in laying out the ground purchased for the chapel on the south side of St. Alban's Church. Mr. Charles H. M. Mileham is the architect.

Mr. James Ward, for many years assistant deputy surveyor of the Forest of Dean and High Meadow Woods, died on the 19th inst. at his residence at Coleford.

At Rangoon on Monday, Prince Albert Victor formally inaugurated the new waterworks and the sewerage and drainage works constructed by Messrs. Shone and Ault on their system, and afterwards attended a public breakfast given by that firm.

The restoration of the remarable figure known as the Wilmington Giant is now being taken in hand by the Sussex Archæological Society, and being actively prosecuted. Investigation shows that bricks were used for its preservation more than a hundred years ago, but, at the request of the Rev. W. A. St. John Dearsley, the committee of the society have consented to allow him to experiment with rammed chalk.

The time for depositing, in the House of Commons all Private Bills that will be brought forward in the ensuing session of Parliament expired on Saturday. The total number of Bills deposited is 243, an increase of 36 when compared with the number lodged last year. Of this number 117 relate to railways, docks, and canals, 27 to gas and water undertakings, 21 to tramways and subways, seven to electric lighting, 32 are deposited by corporations, county councils, or local boards, and 39 are of a miscellaneous character.

Alterations have been made to the town hall, Reading, and special attention has been paid to the ventilation. The latest improved form of Messrs. Robert Boyle and Son's self-acting air-pump ventilator being adopted for the extraction of the vitiated air.

A new Bible Christian chapel and schoolrooms were opened at Pentewan on the 9th inst. Mr. G. Pedlar, of Tregiskey, was the architect, and the chief contract was taken by Mr. H. Davey.

"BUILDING NEWS" DESIGNING CLUB.

A DOCTOR'S HOUSE.

ONCE more another session, so to speak, of the work of our useful Designing Club has commenced with a very large number of contributors, showing how wide-spread an interest among students, at any rate, continues to be taken in the competitions thus inaugurated. The high standard of excellence hitherto aimed at, and not infrequently attained by those who in past years have joined our club, is not, of course, quite easy to maintain, and we necessarily rely upon our members in this respect, hoping that no endeavour will be spared on their part to keep up the character of work sent in. In so large a class we expect to find some who will only join in a half-hearted way; but it is only by thoroughness that self-improvement can be secured, and success cannot be insured without hard work. With these preliminary remarks we turn to the designs sent in for subject A., "A Doctor's House for a Village, with a Surgery Attached," and these are the conditions which we issued for the guidance of competitors:—"Site with 45ft. frontage to main road, and houses on either side. Forecourt 15ft. deep from frontage line. Cost to be about £2,000. Accommodation to comprise two parlours and a study, the latter leading into surgery, which is to have a side entrance. Provide a good hall and a staircase, which is to be well out of view of the entrance door. Kitchen, scullery, and usual conveniences. Depth of site may be reckoned at 120ft., and the garden must not be spoiled by the back offices. On the first floor there are to be three bedrooms and a nursery, bath-room, and w.c., with ventilated lobby to it On the upper floor provide four bedrooms and a box-room, with space for a cistern. Material red brick and stone, sparingly used. Tiles for roof, and plastered gables, which feature may be optional. Scale 8ft. to the inch." We place "The Red Rover" first, "Myth" second, and "North Star" third. Accompanying these remarks illustrations will be found of both the first two designs, and the elevation of that placed third. We cannot say that we feel enthusiastic about any of them, but they are the best of those sent in. The "Red Rover" exhibits some skill in planning and good taste in design; but his contribution shows a want of simplicity and an absence of breadth in treatment which is so essential in good work. In a house of restricted frontage, and where, as in the present instance, most of the light has to be obtained from the front and rear of the building, we are aware that it is not easy to avoid the objections just stated; indeed, there are few structures more difficult to design properly and effectively than a small house of this kind, and it is just this reason which gives the subject an enhanced interest. Taking "Red Rover's" ground-plan first, it seems that neither of the rooms would be very comfortable to sit in, and the kitchen, partly under the staircase, is badly contrived. The juxtaposition of the two parlour doors is not suggestive of dignified arrangement, though this in a way is a minor matter. There is no cloak-room, and the hall is a trifle too confined. The drawing-room would not be improved by the inspection window out of the porch, and the bay placed on one side of the apartment is not a cheerful contrivance. The dining-room is too square, and the garden entrance, by rendering the room a passage way, would not improve its comfortableness, while the wall space on that side of the room would be spoiled greatly as available space for furniture, to say nothing of the draught between the doorways. The service between the kitchen and the dining-room is not faultless, and the lobby on the plan would be of questionable advantage in execution. The fireplaces in the study and surgery are too near the windows for comfort, and the patients' entrance should have no connection with the kitchen. Upstairs the rooms are good on both floors, though we would point out that the w.c. lobby entrance is in too public a position off the main staircase. The elevations speak for themselves, and if we have a preference, it is for the side front, though this would not be seen in reality, as depicted in the sketch, for the very good reason that adjoining buildings would hide it. "Myth," in not a few points, has a better plan than "Red Rover," and we shall hope to see some good designs from his hands; but, on the whole, we think that the latter deserves the preference on this occasion. For one thing, "Myth" sends but one elevation, and no sketch is given. The hall is roomy, and the staircase is out of the way of the front door. The window looking into the dining-room out of the porch is not conducive to privacy, neither would the canted window to the drawing-room on the other side of the entrance be quite free from the same objection. The surgery entrance is rather well managed, but the w.c. would be very low on account of the staircase. The waiting lobby would have been improved by a fireplace, perhaps, but the surgery and study are nicely contrived. The kitchen is wanting in room for a dresser, and is too cut up by doors, like the scullery. The bedrooms are not bad, though the dressing-room should have had a second door for service from the landing. The chimneys from the study and surgery have to get away very quickly from the centre of the house towards the back, to reach the chimney stack shown on the attic plan; indeed, the two bedroom fireplaces on the first floor are very much in the way of this, and the pitch of the room being only 8ft. 9in., renders the problem all the less easy. The massive chimney-stack shown on the section would have to be balanced on the wall below in a questionable fashion. We much prefer "The Red Rover's" elevation, though "Myth's" façade would look fairly well as houses go. The turret is too ambitious a feature for so small a building. "North Star" is more simple, and we think correspondingly more effective, even if the big roof covers in space over the upper part which is not available for use. We do not by any means, however, commend his plan, which is wanting in study and concentration of parts. The porch seen in the elevation we publish is the surgery door, whereas the front door is out of sight in the return wall on the other side of the house. The surgery is fitted up with a counter like a chemist's shop, and the back parlour—presumably the dining-room—has the fireplace in a very draughty position. The author is quite on the right road if only he will devote more care to the practical details: he gives no section, and does not even indicate the heights of his floors by the side of the elevation. Anyhow the attic-floor windows in the gable must be very low down below the ceiling. His sketch, for which we could not find room, is artistically rendered. "Fiddler" works in a style which commends itself to our judgment, and his elevation indicates a knowledge of good old domestic buildings, but his drawing is open to improvement. His planning is exceedingly poor and ill-considered, with long narrow rooms everywhere, and a vast hall as well as staircase landing, big enough for a house more than double the scale of this one. We trust "Fiddler" will take note of what we say and do better in this respect.

"A.G." in a circle has studied his plan carefully; but he ignores our instructions, and so brings his tradesmen up from the rear, and thus obviates the necessity of a side entrance. His hall is roomy and fairly well lighted; but the porch cuts into and spoils the drawing-room. His elevations are pretty, and though the front is wanting in breadth on account of the breaks, it shows good taste. "Vyrnwy" puts a silly angle-cut porch with a pent over, while brought out above this is the lean-to roof of the side gable, carried on a great, ugly wooden strut. Otherwise the design looks suitable for a country site, even if we cannot praise the plan. "Country Bumpkin" is the author of a design not quite so good in style, also with half-timbered upper stages. "Skull and Crossbones" goes in for a brick treatment of poor proportions, with a plan which, we must say, is not much better. The author, however, does not fail for the want of trying, evidently.

"Cosmopolitan," in an airy sort of way, sketches the view of his design as if the ground line was above the trees, making the whole thing appear among the clouds. The elevation of the front, notwithstanding, is very original, and somewhat clever—indeed, the author ought to make his mark on the work of our club. For the present we cannot place him higher, his plan being more ingenious than good. Thus, the patients' entrance opens into the lobby, which does duty in connection with the kitchen, and out of which the servery hatch is worked. Not an inch of room seems available for the patients to wait in, while the surgery itself is much too small, answering more as a passage way to the study. The conservatory, by shortening the drawing-room, quite spoils it. The drawings are good, and the author evidently is a serious worker. Our competitor "Fiddler's" second design ranks next, but is not equal in any way to the one already mentioned, and, besides, is careless in drawing. The w.c. looking into the surgery porch is a most objectionable arrangement. "Lord G." is right in the main, for he covers his house with a simple hipped roof, which, when well managed, is always effective. The row of three gables in front breaks up the skyline, and the bay on one side gives quaintness to the otherwise symmetrical composition. It is in the details that "Lord G." fails, his entrance doorway being, for example, very ill-proportioned and poor. The hall would be dark, and is wasteful, like the landings above. The dining-room has an uncomfortable look about it, with no room for the chairs to stand in. The sideboard would have to be placed at the wrong end of the room, in reference to the service pantry. "Yeoman" affects an American style of draughtsmanship, and shows half his windows smashed in to give, we presume, a picturesque effect. Not that he draws badly; but no good can come in practical work by the adoption of such crudities, which only add restlessness to a design. We like "Yeoman's" elevations very well, although the pent over the garden door between the windows would look most awkward from inside the bays. His plans are far from successful. The passage crossways through the house is unfortunate, and the canted archways between the two parlours spoil these rooms. "Yeoman" ought to do better planning than this Doctor's House. "Tyne" is not commonplace, and tries to be fresh if not original, giving a preference to a Dutch-like style of building. He covers the whole width of the site, and depends upon light from the front and rear. This shuts off the kitchen, and brings the tradesmen ever ringing at the front door. The ugly passage to the surgery is a poor expedient; and we pity the coalheaver on his way to the coal-place through the porch, hall, kitchen, scullery, and internal yard. What a mess he would make, and how he would knock the place about, poor fellow! "Tyne" should have thought of the coals. This may be taken as a type of the planning illustrated generally by his design. "Labor Omnia Vincit," regardless of the rules of composition, dodges his windows in "just where they are wanted." "What more practical thing could he do?" Well, on the face of it, the query seems reasonable enough; but on second thoughts, the questioner will remember that a skilful plan will be so contrived as to secure a well-balanced and effective elevation. In this design we have neither one nor the other. The rooms are too small, and the house from front to back is too thin, though it is not without several points of merit. The drawing is careless, however. "Cassowary" sends in a big perspective, and has evidently gone into the thing with much energy. The surgery is treated as if the doctor kept a chemist's shop, and the dwelling-rooms are put to the back of the building. The porch, vestibule, and hall are wasteful, taken together, and yet are neither roomy nor well lighted. The elevation is better than the section; but the low, curved dormers so popular in Transatlantic cottage architecture are ugly and un-English. "Multum in Parvo" is much more safe in the style he adopts, and his building is by no means unworthy of a British doctor. This worthy would find the series of little rooms devoted to his professional duties very crowded together and needlessly numerous. Thus we have a vestibule, waiting-room, consulting-room, surgery, and then the study. The windows in the return wall would be blocked up by the adjoining peoperty. The front porch cuts a slice off the drawing-room, and the back staircase lobby leading to the garden-door occupies valuable room in the middle of the house, where it is wanted for more important uses. The perspective accompanying this design is very well done, but it shows the house on an open site which the conditions did not provide for. "Syak's" back elevation is very pretty, and his front is not half bad; but his plan is wasteful, ill-considered, and inconvenient. We do not like it one little bit. But for his façades, this designer would have been placed much lower down in the list. "Pat" is also an artistic contributor, who fails by reason of his poor planning. The big dormer rising over the openings of the first-floor windows flush with the front is not happy, from an architect's point of view. The hall is very wasteful, and the whole house looks ungainly inside and ill-contrived.

"Wallaby" draws in an unfinished way, spoiling the effect of his elevations by diagonal lines supposed to show shadows. As to the plan of this design, although it bears evidence of ingenuity, it is cramped and small in its parts. Needless details are introduced, some of which are incomprehensible, and are introduced seemingly for the sake of the thing. Thus there is a drop from front to back on one side of the house, causing awkward steps into the drug store and down to the side vestibule. Again, the examining couch occupying the bay window out of the surgery, and overlooking the tradesmen's entrance just outside, would prove an unsuitable arrangement, rendering public a private operation without really being convenient for the operator. "Sarchedon" gives us an odd-looking building with a plastered upper stage running along the façade like a deep cove under the eaves. The gabled pent over the door is childish and hideous. The bay is cottage-like, and the double dormer gables are in character with it. The plan is disposed without much thought round a perfectly dark hall. The coal-cellar would be about large enough for a sack of coke to stand in. "Rock" is a very indifferent draughtsman, pottering about all over his elevations with scribble, never knowing when to leave off, and finishing nowhere. He has a notion of the picturesque, however, though not of the comfort of people who feel sick, seeing that he places the patients' waiting-room next to the scullery, with a door out of it connecting both with the surgery. What with the smells of the drugs on one side, and culinary odours on the other, they would have a lively time of it—too dreadful to think of. If there were no good points in this design we should have placed it much lower down. "M." in a square, is, in some respects, better than the last named, and his elevation is not so ambitious. His plan cuts up queerly, with a perfectly dark hall in the middle, and kitchen which would be nearly dark, besides being cramped in the extreme, and having a door opening right on to the cooking range. The "ingle," so called, out of the parlour is trivial, and would make the room very draughty. "Damian" has a design which would work out better than his bare outline elevation seems to allow, and the plan of the house is fairly convenient, though we have to point out its excessive depth covering too much of the land portioned out for the building. The hall particularly is overlarge, and the internal area or yard between it and the dining-room to the rear suggests the exigencies of a town site, which hardly agree with the conditions. "Lux" puts himself out of court by wasting space in an unlimited manner over an immense hall, repeated on the first floor with a landing extending every way. The front elevation, if not striking, is without serious faults in a semi-Gothic style. "P. R. G." fusses up his elevation with features which go far to spoil that which in the main is by no means a poor thing. The parts in themselves call for little objection, but the façade requires greater breadth to be effective. The plan, too, has many good points, though the rooms are small, and much space is wasted on the staircase. "St. Tydno" puts his kitchen in the basement, which gives him an undue advantage on the ground floor. His dining-room is an ugly square apartment, and the back-stair service to it would be most inconvenient. The elevation, of an ordinary villa type, does not "fetch" us; there is as little to admire in it as to be worthy of fault-finding. "West Anglian" goes in for a similar safe, insipid elevation, accompanying it with a workable plan, however, showing study of its parts. The two parlours are ruined by the foolish and pretentious recessed fireplace arrangement. How could anyone sit in these chimney corners with any comfort? "Glaucus," with a brightly-rendered elevation, breaks up his frontage line somewhat unduly, and seems fond of diapered bricks, which seldom look well, really. The surgery and study dividing a big bay between them, are all angles or openings, and the main entrance is narrow and mean. "Mac" gives a Norwegian look to his house by drawing great pantiles on the high-pitched roofs in vertical lines, otherwise the outline is not so bad, in spite of the atrocious surgery door pinched up under what some folks would call a "gablet." The relative position of the big hall to the reception-room is curious, as one has to reach them by way of a tiny lobby in the angle. "Horseshoe" makes a feature at the corner of his design by a circular bay carried up into a sort of tower, supposed, evidently, to make a very telling finish. The roofing is a problem not worked out in detail, though the plumber would no doubt oblige. The square bay has a belvedere overhanging gallery from the attic level off one of the bedrooms. The porch has a Gothic arch to insure importance. The plan is better than the elevation, but the surgery entrance lobby is too small. "Niger's" porch, opening on to the surgery window, leads rambling through a lobby into a vestibule, and so we reach the hall and branch off to the right into a side passage bringing us to the study and surgery, one on either hand. The elevation, with the upper part in half-timber, is simply treated, and would pass muster in an ordinary suburb for a fine thing, even if the occupier blamed the author, as he inevitably must, for his ill-arranged plan. "Medicus" extends his house from party-wall to party-wall, and so leaves no way to reach the kitchen and offices except through the house, for our published conditions provided for no entrance at the bottom of the garden. His plan would be good if the hall had any light in it, which it has not. The elevations are poor, the back front being the least objectionable of the two. "McGinty" sends a very good elevation, not badly drawn, too, in perspective. The principal door is at the side; but there is no tradesmen's entrance, and the dining-room looks on to the side wall of the adjoining house, all view of the garden being sacrificed to the ashes, coal-place, and larder. The plan, in some other respects, is first rate. "Orme" gives us a quiet, effective Late Gothic front with stone mullioned windows and well shaped gables. His plan will not stand investigation, and only the study looks on to the garden behind. The surgery is lighted from the top, and would be dismal enough. "Westward-ho" is so near doing better work that we shall soon expect to see him higher in our ranks. His house has got an ugly hip on one side, and the projecting gable brought out over the recessed lower part of the main front is spoiled by the ends of the joist brought through the cove cornice, the too-wide bay, and the horizontal line at the eaves level. Why set back the ground floor thus? There is not a single advantage gained, and the tiny break above is too slight to be effective. The planning of this design is bad. "Signum" falsifies his elevation by his perspective, which imports a width into it, unknown in the geometrical drawings. The overlarded little front, drawn in brown, is too ambitious. There is some originality in the plan, which is one of the best sent in; but the rooms are too small. "Jerry" is the author of a dodgy-looking cottage, with an arch thrown in a 'cute way off the bay over the porch, the main wall being brought forward on the other side by means of a wooden corbel. If the designer here represented studies good examples we think he will soon drop this ghost-like style of drawing, for we note evidences of good taste in his design, though we cannot say his plan shows much study. "Nox" is neat, and has a notion which keeps him above the regulation style of thing; but his Doctor's House lacks compactness, and is wanting in concentration architecturally, having an alloverishness which destroys all effect of scale. "Lycidas" makes a feature of an octagonal central hall, and cuts his dwelling up accordingly. The elevation is not so telling in perspective, which in this instance is a weak performance. We have only space left to enumerate the remainder in their order of comparative merit:—"Herbert," "K. W. T.," "Koko," "Spider," "Dr. Jekyll," "Scot," "Dono," "Point," "Robin Hood," "Anvers," "H" in a square, "Streona," "Dot," "Cyclist," "Lux," "Gamekeeper," "Rustic," "So and So," "Chamfer," "Haste," "Reference," "Goth," "Jack," "Renaissance," "Berkie," "Coverac," "Q. E. D." "Sabrina," "Menelaus," "Faust," "Donovan," and "Argus."

STUDY CHIMNEYPIECE WITH BOOKCASE WINGS.

We received only a few designs for our second subject, the instructions for which were as follows:—A study chimneypiece in walnut with bookcase wings running up to ceiling 9ft. high. Width of chimney-breast 6ft., recesses for bookcases 14in. deep, one 3ft. 6in., and one 2ft. 9in. wide. Lower portion fitted for folios, with part of doors panelled, the rest being glazed. Slow-combustion grate, and tiles round it. No shelves above mantel. Scale inch to the foot. Elevation, plan, and section. Key sketch optional.

We cannot say that any of the answers received in response to this problem are very successful. We have given the first place, however, to "Wallaby," whose design is herewith illustrated. It shows a brick arched opening for the fire with birds carved in the spandrels somewhat like a well-known American chimneypiece. The lockers are treated in a German sort of style, more suitable for solid panelled doors than glazed book cases. We do not like this scheme very much. "Coaly Tyne" has in a way more the sort of thing we wanted; but his design is so cut up and overdone that we could not place him first. The bookcases would have been so much better if the fronts had been simply divided up into squares. Nothing looks worse than the elongated panels he has adopted. The chimneypiece treatment above the mantel is commonplace enough for the Curtain-road. The polished brass "slip" in lieu of a marble one is a questionable innovation, and the mantelshelf seems to fit in an unhappy way upon it. "Skull and Cross-bones" adopts a Renaissance type of work, but the open book-shelves are of but little interest, and the dust-trap at the top shown, for pots to stand upon, is most objectionable. "P. R. G." makes a most pleasing design, but it is overdone, and the vertical bars to the upper book cupboards are ugly, particularly to the narrower doors. The chimneypiece is after a regulation French example. "Bumblechump" cuts up his lower cupboard doors in slip-panels in a costly and ineffective fashion, though his upper cases would look well, but are rather uninteresting. The big mirror over the fireplace is out of scale with the rest. "St. Magnus" sends a tasteless design poorly drawn, with the books all set forth in rows. "Cyclist" shows no side cupboards as required, but puts two over an ugly fireplace. "So and So" is mad on semicircles, and maked a hooded over-mantel. The coal-box worke-in the jamb is neither new nor good. "Schplüts termückischen's" plan is more adapted to a boudoir, with its mirrors and all the rest of it—features which fuss-up the design, and yet fail to give it point or finish. "Spider" is the last, making a feature of a queer circular fireplace, on the face of which square tiles are worked in. The overmantel is trivial, and the side cases are incongruous. The writing and reading-desk show ingenuity, but were not asked for. The bookcases have open fronts.

NEW PANORAMA, WESTMINSTER.

YESTERDAY the large, new panorama, which has been for many months in course of construction in Ashley-place, Victoria-street, Westminster, was opened to the public. The main fabric is entirely of iron, and is so built that it may readily be removed and re-erected elsewhere on almost any conceivable site, wherever space may be found. Like the panorama built in Paris early in the year, it is intended to be moved and carried about from town to town, and with this main idea everything has been most carefully designed by the architect, Mr. Robert Emeric Tyler, F.R.I.B.A., of Gower-street, Bedford-square, who also planned the Paris building just mentioned, as well as the front lounge and entrances to the well-known panorama in York-street, S.W. Messrs. John Butler and Sons executed the structural ironwork, Mr. R. J. Gifford Reade, Assoc.M.Inst.C.E., being their representative here as also for the panorama in Paris. Messrs. Croggon and Co. supplied the galvanised iron covering for the walls as well as the zinc with which the roofs of the wooden buildings are covered. Mr. A. Bricknell was the general contractor, and Mr. T. W. Helliwell furnished his patent glazings for the top lights throughout. The warming of the buildings was done by Messrs. Messenger and Co., of Loughborough. The circular or main structure, containing Chevalier Philip Fleischer's great picture of the "Battle of Waterloo," is formed of stancheons 50ft. high, about 15ft. apart, and measuring 15in. by 12in. in thickness; between these are horizontal ties or girders bolted into the uprights with stout diagonal struts and ties, so contrived that the whole fabric is compacted together like a drum, and thus is qualified to withstand almost any amount of wind pressure without strain. Outside the walls are covered with corrugated galvanised iron plates of ordinary dimensions, carried by clips which rest on the flanges of the horizontal girders already mentioned. The internal diameter of this

building is 130ft. It is surmounted by a wooden superstructure, which is externally treated as a frieze, and covered with flat iron plates, divided into panels by ornamental framings, all in colour. The awning extending over the platform, from which the canvas is viewed, is supported entirely from the tie-beams over the centre, and the sky-lights are arranged in the usual way above this level with the reflectors and electric-lighting apparatus. The panorama itself is quite the best that we have seen, and the foreground is particularly well managed. The perspective of the roads, and grouping of the middle-picture objects before the canvas is reached, are singularly well-arranged, and the whole thing is as realistic and natural as could well be conceived. The front building, or lounge, furnishes a great feature, and will be greatly conducive to the comfort of visitors. It measures 100ft. long by 46ft. wide, and is entirely of wood, with facings inside of Pavodilos boarding, which shows no joint. The boarded floor is laid direct on to a foundation of breeze concrete, without any joists whatever. The walls are harmoniously coloured in quiet tintings, somewhat French in character, and large casements are ranged round the room effectively, with draperies to give a finish. Right and left are lavatories and conveniences for ladies and gentlemen. Outside an architectural character is obtained by the use of Vieille-Montaigne zinc pediments and cornices very well executed. From a constructor's point of view, the building is interesting, and some care has been exercised very wisely not to aim at too permanent or, rather, monumental a style of treatment for what after all must be viewed as, comparatively speaking, a temporary building. In this the architect has shown his judgment, at the same time making the building as fairly effective as could be reasonably expected; indeed we may say he has made it eminently suitable for its purpose.

DISCHARGE OF SEWERS.

THE phenomena of rainfall and discharge of sewers should be based on extended observations carried on during various conditions of the ground. Those ascertained and published in books are often unsatisfactory, as the data upon which they are based are often imperfect. Many writers have given tables and diagrams having more or less approximation to the truth, or to some definite rule. The following conclusions are approximate, and are condensed from an American authority. The percentage of the rainfall discharged from any given drainage area is nearly constant for rains of all considerable intensities and lasting equal periods. The percentage varies with the degree of urban development, or the amount of impervious surface. The percentage increases rapidly with the duration of the maximum intensity of rainfall; the same percentage becomes larger when a moderate rain has immediately preceded a heavy shower, thereby saturating the permeable territory, and increasing the impervious surface. The sewer discharge varies promptly with all fluctuations in the intensity of the rainfall, and becomes a good record of the rainfall and its degrees of intensity. It is found, therefore, that the flood volume is in direct proportion to the extent of impervious surface, and to the intensity and duration of the rainfall. Formulæ have been devised to proportion the sewers; but Hawksley's formula has, in districts subjected to heavy rains, resulted in floods. The storm water that runs off from town districts is often greater than it is supposed. An American writer, Mr. Kuichling, points out that the safe plan to adopt is "to estimate the probable future amount of impervious surface on the given area with reference to density of population, and to assume that all the water which falls upon such surface will run off without loss"; then, as the grades and lengths of the longest tributaries to the outlet sewer can be determined, as well as their diameters and the velocities of flow therein, the time required for the flood waters to reach the outlet sewer from the most distant point can be found. Emil Kuichling's paper on this subject is an important contribution, and the results he has shown are derived from a series of gaugings of flood discharge of a number of large sewers in the city of Rochester, N.Y. It is to be regretted English engineers have not the same facilities for studying this question; there can be no doubt a large number of our new town sewers have been proportioned on imperfect data, and that a smaller area of impervious surface is included in the calculations than really exists. The permeable area of a district soon becomes saturated, and then contributes quite 15 per cent. of the rainfall to the sewers. According to the formulæ examined, the sewer discharge in cubic feet per second is very various, and applied to a certain district gives in one case (Hawksley's formula) 68·97 cubic feet per second, in another (Bürkli Ziegler) 99·44 cubic feet, in another (Col. Adams's) 107 cubic feet, and by McMath's formula 121·41 cubic feet; whereas E. Kuichling makes the discharge, according to his own rule, 190 cubic feet. These varying results speak for themselves.

THE GLASGOW MILL CATASTROPHE.

AN inquiry at the instance of the Secretary for Scotland into the circumstance attending the fall of Messrs. Templeton's mill in Glasgow, by which 29 of the workers lost their lives, took place on Friday and Saturday at the Burgh Court-hall. Col. Malcolm, commanding the Royal Engineers in Scotland, and Mr. W. W. Robertson, of Her Majesty's Board of Works, Edinburgh, were the Commissioners. Mr. Allan M'Lean appeared on behalf of Mr. William Leiper, architect, of Glasgow. Mr. Harvey, of the firm of J. and A. Harvey, of Govan, engineer and architect, who prepared plans of the interior and machinery of the mill; and Mr. Leiper, the architect who designed the elevations, gave evidence as to the thickness of the walls. The latter said the detailed drawings of the whole of the iron work and all the structural parts came into his hands through Mr. Harvey. His understanding with Mr. Templeton at the beginning was that he was to have nothing to do with the structural portion of the mill internally. It was a matter on which he was never consulted, and he did not profess to be a mill architect. Mr. Robertson: Your statement differs from that of Mr. Templeton in one very important particular. Mr. Templeton stated that Mr. Harvey's employment extended principally—in fact, almost wholly—to the arrangement and planning and general arrangement of the mill, with a view to its fitness for carrying on the special work for which it was intended. Your present statement is that Mr. Harvey was the engineer of the whole structure. He was the person employed to design the structure, and you consider your function was to bring it into an architecturally satisfactory form? Witness: That is my position. Witness further stated that he admitted responsibility for the sufficiency of his plans as far as experience went, subject only to the convenient arrangement of the internal area for the main purpose for which the mills were to be designed. So far as he understood the subject, the plans which he submitted were, in his estimation, amply strong for general safety and that sort of thing; but the construction of the floor and the arrangement of the looms gave him no concern at all, because it was in the hands of a man who was perfectly competent. By Mr. M'Lean: He did not take the responsibility of the stability of the mill except in so far as he deviated from the engineer's plan. By Colonel Malcolm: He had superintended the execution of the work. Substantially, the building was of brick, partly laid with cement and partly with mortar. The building was completed as far as the battlements, and the cornice was set when the accident happened. He could only account for the accident by the force of the wind, which, according to the evidence of Professor Grant, of Glasgow Observatory, was blowing in gusts at the time of the accident at the rate of 48 miles an hour, with a pressure of 17lb. to the square foot. The evidence of most of the professional witnesses was to the effect that the accident was due to the force of the wind and the fact that it caught the building at a crisis of its construction right in front. Mr. Mason Deacon, one of a firm of builders, gave it as his opinion that a serious departure had been made from the ordinary course of mill construction. The resting of the joists on the longitudinal runners was utterly insufficient to steady a mill of 73ft. high. The joists should have been let into the walls, so as to bind the whole building together. Mr. John White, assistant master of works to the Glasgow town council, deposed that he and the professional members of the Dean of Guild Court had been quite satisfied with the plans of the mill. His impression was that the very strong wind that was blowing at the time, catching such a large surface of wall without any opening, was the sole cause of the accident. John Mair, inspector of the building on behalf of the proprietors, spoke as to the excellence of the work. He had been 18 years an inspector, and considered Messrs. Templeton's mill to be the finest piece of brickwork he had ever superintended as to actual work. Mr. T. L. Watson, architect, compared the walls of Messrs. Templeton's mill with the provisions of the Metropolitan and New York Building Acts, from which he found that they were sufficiently strong to have been in accordance with those regulations. He was of opinion that the accident was not attributable to any defect or insufficiency, or to the fact that the joists were not built into the walls. Mr. W. Arrol, the builder of the Forth Bridge, said the building ought to have been very substantial; but, considering its exposed situation, he would have put up temporary supports and diagonal wire rope bracings between the front and back windows, and have boarded up the windows. On the day after the accident the anemometers on the Forth Bridge showed a wind pressure of 29lb. on the square foot. Mr. Robert Taylor, builder, submitted a report, which he and Mr. M'Cord, also a builder, had prepared for the legal authorities, under instructions from the Procurator-Fiscal. The conclusions at which they arrived as to the cause of the disaster were as follows:—The collapse of the building was owing to the action of the wind on the large exposed surface of the front wall. They thought that the walls might have stood had the floors and roof been on, but that the arrangement of joisting as carried out did not give the same stiffness to the building as if the joisting had been set on wall-plates and built into the walls in the ordinary way; that while money had been lavishly spent in making the work complete, an error of judgment had been made in making the walls too weak for so long a stretch by being cut up by large openings, and in departing from a mode of construction which experience in other large factories had proved to be efficient without leaving a sufficient margin of strength in the walls to meet possible contingencies. Colonel Malcolm intimated that the report of the Commissioners would in due course be presented to the Secretary for Scotland.

CHIPS.

Lords Justices Cotton, Fry, and Bowen on Saturday gave judgment in the Banstead-common case. The commoners brought an action to restrain the inclosure of parts of the waste land acquired by certain tenants from the lord of the manor, and Mr. Justice Stirling had decided in their favour. This decision was upheld by their lordships.

The Paris correspondent for the *Daily Telegraph* says workmen's dwellings on the Peabody principle have now been opened in Paris, under the auspices of the Prince d'Arenberg and the members of the Philanthropic Society. The Philanthropic Society has already built a house with the money in the Rue Jeanne d'Arc, and the dwellings opened on Friday are on the Boulevard de Grenelle, the *appartements* being rented at from £10 to £14 a year, whereas some in the other tenements may be had at a rental of a little over £6. The sanitary arrangements are much better than in other parts of Paris, and many hints are said to have been borrowed from the London dwellings erected under the Peabody Trust.

At a special meeting of the County Council for Staffordshire held last week, a long discussion took place with reference to the arrangements to be made for the discharge of the county surveyor's and allied duties. Eventually the report of the Main Roads Committee was adopted, and it was resolved that it was not desirable in making arrangements as to main roads to alter the duties of the county surveyor. It was also decided to appoint a chief road surveyor and assistant surveyors at an aggregate cost of not exceeding £2,000 a year, and with such duties and on such terms as the committee may determine.

The Municipal Offices Committee of the York Corporation have recommended the City Council to accept the tender of Messrs. Parker and Sharp, of York, for the erection of the New Law Courts in Clifford-street. The tender is £17,067.

In connection with the York Architectural Association, a conversazione was held on Friday night in the Burton and Feversham Galleries of the Yorkshire Fine Art Institution, and passed off successfully. There was a large company present. During the evening the band of the 3rd West Yorkshire Regiment performed selections of music.

Building Intelligence.

Abergwili.—The parish church of Abergwili has just been reopened by the Bishop of St. David's. Considerable alterations and improvements have been effected in the church. The east end has been restored and beautified at the entire cost of the Bishop and Mrs. Basil Jones, in memory of Mr. George Henry Loxdale, the father of the latter. The east end wall has been entirely rebuilt, the facing inside being of Bath stone and forming the back of effective arcades, the moulded arches being supported by dove-coloured marble columns. A super-altar of Sicilian marble and a piscina of stone have also been added. This part of the work, which cost £300, was executed by Mr. Josiah Jenkins, Lampeter, from the designs and under the superintendence of Mr. Ewan Christian. The new east window was designed and executed by Messrs. Heaton, Butler, and Bayne, London, and cost £200. The subjects represented in the three divisions of the window respectively, are (1) above, the "Transfiguration"; below, the "Baptism of Christ"; (2) above, the "Crucifixion"; below, the "The Entombment of our Lord"; (3) above, the "Ascension"; below, our "Lord's Appearance to St. Mary Magdalene." Above these divisions there is a small circular window, which has a representation of "our Lord seated in Glory." A handsome brass eagle lectern, set with precious stones, has been presented to the church by the Bishop, and nearly five thousand pounds have been expended.

Acton Burnell.—After having undergone extensive restoration and complete internal redecoration, the historic parish church of St. Mary, Acton Burnell, was on Monday week reopened. Some two years ago Mr. F. B. Wade, of London, was appointed architect, and a Mr. Williams, of Ruabon, was intrusted with the contract; and for over a year they held those positions. Then unforeseen circumstances arose, and Mr. M. P. Childs, of Acton Burnell, offered to see to the restoration being finished promptly. His services, which were given gratuitously, were accepted, and he has supervised the work up to the time of its completion. The walls have been in places rebuilt, and had their foundations underpinned. They have also been pointed throughout. A new tower has been erected at the north-east corner of the nave, and the lower portion of it serves as an organ-chamber and vestry. In the upper part are three bells, two of which have been recast and one retuned by Mr. Barwell, Great Hampton-street, Birmingham. An entrance to the chancel, which had been closed for many years, has been reopened. Internally the walls have been repaired, strengthened, and plastered afresh. The old roof of stone slabs has been replaced by one of red Broseley tiles, and the ceiling which concealed the massive oak rafters has been taken away. An open roof, with heavy dark woodwork, has been put up. All the windows have been reconstructed, and reglazed with cathedral glass. In the chancel a pavement of encaustic tiles has been laid by Mr. J. C. Edwards, of Ruabon, and the cold stone floor of the nave has given place to a floor of patent pitch-pine blocks, by Mr. Roger L. Lowe. A heating apparatus fixed in the lower part of the tower was supplied and erected by Mr. W. B. Morris, Shrewsbury. New seats have been constructed out of the old ones, and all the pews are now of plain oak and of modern shape. The pulpit and the lectern have been rebuilt, from designs by Mr. Childs. For so small a church that of Acton Burnell is wonderfully rich in ancient carvings, inscriptions, monuments, and tombs; and of those all such as could safely be cleaned have been given a brighter tone. The cost of the restoration has been about £2,000.

Haughton Hall, Staffs.—This fine old half-timbered house, having lately come into the possession of the Rev. C. Twemlow Royds, of Heysham Rectory, Lancashire, has just undergone restoration. The building was rapidly falling into decay, and its chief features had been practically obliterated by modern vandalism. The ground plan is a T. The timber framing is very massive and of elaborate design, and the panels are filled with plaster over short cleft laths, fitting into grooves. The house dates from the time of Henry VIII.; but one portion at the back is of Queen Anne's time, and is of red brick with stone dressings. The gable fronting the road is very richly treated, having four separate tiers of ornament, all varied. The corbels are richly carved out of the solid. Deep, plain barge-boards, capped and slightly moulded, have been added to all three gables and the dormer window, and spear-headed hip-knobs surmount them. The roof, originally of thatch, has been stripped, and the old thick red tiles have been re-used. The west side of the house has its original timber-framing down to the ground; but on the three other sides a considerable portion of the walls, up to the first story, has been underbuilt in brick. The foundations are of stone. An old stack of fan-shaped chimneys is a great feature in the outline. The structure of the chimney is very massive and is built of worked stone. Its base measures 10ft. 10in. by 9ft. 8in., and the chimney seems to have been built first and the house added to it. The principal entrance, which had been entirely modernised, has been restored with a Tudor arched doorway; and a massive oak door, studded, and having specially-designed hinges and escutcheons, gives it its original appearance. All the modern window frames have been abolished, and the lintels, jambs, and sills of the windows are now formed by the main timbers. The massive beams and rafters, with their chamfered edges and moulded stops, have been scraped and oiled. The partition walls are formed of vertical timbers with plastered interstices, and these have been treated in the same way. In the great hall and parlour there are moulded oak mantel-trees on moulded stone jambs; that in the parlour being like those in Shakespeare's house at Stratford, but of finer dimensions. In two of the bedrooms there are also moulded stone mantel pieces, with brick herring-bone work at the backs of the fireplaces. Three pieces of carved work have been discovered, and these are now shown in suitable positions. The restoration has been carried out from the designs, and under the superintendence, of the rector, the Rev. G. T. Royds; and has been executed by Mr. Royds' head workman, Mr. James Harrison, of Heysham, and other men under him. The walls have been thickened internally, the windows re-glazed throughout, and new floors, doors, &c., added where necessary.

Hemley.—The church of All Saints, Hemley, Suffolk, has been rebuilt during the present year, in accordance with designs prepared by Mr. Frederick Barnes, of Ipswich, and Mr. Howard Gaye, of London. On the church being surveyed, with a view to restoration, the walls and roofs of the nave, chancel, and porch were found to be so decayed and insecure that it was deemed unadvisable to attempt to repair them. The chancel has been extended 8ft. beyond the east wall of the old church. On a close examination of the old masonry some of the windows were found to be sufficiently preserved to indicate the date of the church, which has been adopted in the design of the new work. The old doorway at the south entrance was a good example of the Decorated period, and has been reinstated, and a window to the memory of the late rector, Mr. Exton, replaced in the south wall of the chancel. The walls of the new church are built of rubble in Portland cement; the outside facing is finished with flints and stone of varied colour. The roofs, which are entirely new, are of pitch-pine, with boarded ceilings, the timbers of the nave being shown. The chancel ceiling is polygonal, divided into panels, with mouldings and bosses in the angles and junctions. The south porch is of moulded oak on stone plinths, with front entrance arch and side open arches of oak tracery. The roofs are covered with plain tiles. All the internal fittings, which are of pitch-pine, are new. The old bench ends, which were of good character, but too much decayed to be used, have been followed as a pattern. The glazing is cathedral glass, with narrow borders. The east window, of three lights, has margins of crimson. The floors are laid with red tiles of simple pattern and ornamental borders. The work has been carried out by Mr. Frederick Bennett and Messrs. Alfred Stearn and Son, of Ipswich.

Jesmond, Newcastle.—The new church of St. George, Jesmond, already remarkable for the costliness of its marble altar and reredos, has become of greatly increased interest by the introduction of elaborate decoration of the chancel. The entire available wall space has been covered with mosaic, somewhat after the manner of the famous 5th and 6th century mosaics in the churches of Ravenna. On the north and south walls are ranged the Twelve Apostles, on a line, as to height, with the three mosaic figures of Our Lord and the Archangels Michael and Gabriel, which form part of the original decoration of the east wall. On the south side, beginning from the east end, the figures are those of St. Peter with the keys, St. Andrew with a cross, St. James the Major with a staff; St. John holding a chalice with a serpent issuing from it; St. Philip with a staff and cross; and last, St. Bartholomew with a flaying-knife. Following on the north side are St. Jude with a halberd; next, St. Simon with a saw; St. Thomas with a builder's rule; St. James the Minor with a club; then St. Matthew with a purse; and St. Paul (instead of Judas), holding a sword, thus completing the twelve. The background to these figures and to all the ornament embraced in the scene, is of a deep blue, slightly varied in tone over the surface. The blue ground is carried above the figures for a distance of 2ft., isolating the figures to some extent from the elaborate composition applied to the higher part of the walls. Above the plain surface of background comes a deep band of enriched conventional foliage, disposed in almost imperceptible gradations of colour, and completing the decorative intention up to the wall string, level with the sills of the clerestory windows. From this point to the roof cornice, the space is covered with conventional ornament. On the east wall the same motive underlies the design. The spandrels over arches to organ-chamber and morning-chapel are filled with figures of angels, having in each one wing outstretched to fill the triangular space of spandrel. The panelled wooden ceiling of the chancel is painted in a scheme of blue, ivory, and gold, each panel containing a separate design. The deeply moulded ribs are overlaid with gold. The entire scheme of decoration is the work of Mr. T. R. Spence, the architect for the church, with the exception of the Apostles, the designs for which were prepared by Mr. C. W. Mitchell, The cost of the church up to the present has been at least £25,000.

Thornhaugh.—The parish church was reopened after restoration on the 5th inst., by the Bishop of Peterborough. Although mainly constructed in the 12th century, it has numerous additions of the 13th and 14th centuries, and considerable alterations at the end of the 15th century and beginning of the 16th, consequent on the failure of the original foundations. The subsidence of the foundations, however, continued in spite of works then done, and a few years ago the building had to be shored up. In this state it remained until six months ago, when the recent work of restoration was taken in hand at a cost of over £3,000. The church consists of nave, north aisle, south transept, and chancel. There was originally also a south aisle. The tower was in the most decrepit condition, and it has been found necessary to take it down to the foundations and completely rebuild it, each stone being refixed in its old place. The north aisle has been entirely rebuilt. The oak open-timbered roof, after being covered up many years with a flat one of lath and plaster, has been restored, and adds much to the beauty of the interior. The chancel has also been refurnished in oak throughout. The sanctuary is handsomely appointed, the furniture and drapery being the gift of Lady Tavistock. The architect was Mr. J. T. Micklethwaite, F.S.A., of Westminster, and the contractors Messrs. Kett, of Cambridge, both of whom were recently engaged in the restoration of Thorney Abbey. During the restoration many finds of interest were made, including a hagioscope commanding the altar from the south transept.

A new co-operative store has been erected at Slaithwaite, and special attention has been paid to the ventilation; the extraction of the vitiated air being effected by Messrs. Robert Boyle and Son's latest improved self-acting air-pump ventilator.

As a Christmas offering, the ladies of St. Andrew's Episcopal Church, St. Andrew's, N.B., have presented to the church a carved oak pulpit, which has been executed by Mr. John S. Gibson, Frederick-street, Edinburgh, from a design by Messrs. Sydney Mitchell and Wilson, architects, of Edinburgh. The style is Early English, to correspond with the architecture of the church. The pulpit, with its moulded base, stands 6ft. 6in. in height. It is octagonal in form, and in the four more prominent panels, in cusped niches, are figures of the four Evangelists, 1ft. 9in. in height. The buttresses between the panels are each finished at their base with a bracket, which carries an angel figure.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Royal Institute of the Architects of Ireland.—The fiftieth (jubilee) annual general meeting of this body was held on Dec. 14th, at 37, Dawson-street, Dublin. The chair was occupied by Mr. Thomas Drew, R.H.A. The honorary secretary and treasurer, Mr. Albert E. Murray, read the annual report of the council. The council stated that the number of members had slightly increased during the past year. The council had not seen their way to take an active part with regard to the Plumbers' Registration Association established this year, but they fully sympathised with its objects. The council felt justified in the course they had adopted with respect to the Architects' Registration Bill by what had occurred. The Bill had now been dropped, and was not likely, the council thought, to be revived until it was taken in hand by the British Institute, together with its allied societies. They looked forward to a not distant day when the question would be ripe for settlement, and when by the united action of the representatives of all the chief architectural societies in the kingdom the matter would be set at rest. The Institute during the past year had formed an alliance with the Royal Institute of British Architects, and the various provincial societies throughout England, Ireland, and Scotland, and that without sacrificing their independence of action. The result would be that their profession would be able to control legislation, and give effect to the views of the profession at large. Mr. G. Geoghegan proposed the adoption of the report and statement of accounts. Mr. L. E. Deane seconded the motion. Mr. J. L. Robinson, A.R.H.A., proposed as an amendment that the paragraph referring to the Registration Bill should be expunged. He said it made them appear to indulge in a pæan over the defeat of the Bill. A new Bill would be introduced soon, and a committee was at present working hard at it. Mr. G. C. Ashlin, R.H.A., seconded the amendment. The chairman said they did not feel themselves bound to support a Bill brought forward by a self-constituted body, as was the case with the last Bill; but they would support one that would be promoted by the Royal Institute of British Architects. The original resolution was eventually carried. A discussion took place as to the proposed viaduct over Beresford-place, and on the proposition of Mr. Geoghegan, seconded by Mr. W. M. Mitchell, the following resolution was unanimously passed:—"That the Institute recognises that under the difficulties and restrictions imposed by the Loop Line Bill, the Corporation of Dublin have done all in their power to modify the objectionable character of the viaduct across Beresford-place; on the other hand, it is of opinion that the Port and Docks Board, in the separate exercise of its powers, neglected its duty to the citizens in approving, without any reference to public opinion, of the designs of a viaduct across the Liffey incongruous with the structure in Beresplace, and of much more objectionable design; that the responsibility for this serious disfigurement of the city lies with the latter body." It was decided that in future the entrance fee for members shall be half a guinea, and that the annual subscription for Fellows shall be one guinea. In view of the anticipated increase in the funds by reason of this change, it was decided that prizes shall be offered for the best papers. The election of officers, council, &c., resulted as follows:—President, Thomas Drew; honorary secretary and treasurer, Albert E. Murray; council, Sandham Symes, J. J. O'Callaghan, J. R. Carroll, Geo. C. Ashlin, Chas. Geoghegan, Wm. Mitchell, Thomas N. Deane, J. L. Robinson, J. H. Pentland, and R. C. Millar; auditors, W. H. Byrne and T. N. Deane; Fellows, R. C. Millar, Dublin; R. Watt, Belfast; S. F. Hynes, Cork. A cordial vote of thanks was passed to Mr. W. H. Lynn, Belfast, on his retirement from the presidential chair, which he had filled for the last three years.

Mr. J. T. Harrison, Local Government Board inspector, held an inquiry at Southport, on the 19th December, concerning an application by the corporation for powers to borrow £30,000, for foreshore and other improvements now completed, and for a further sum of £25,000 to meet the cost of the lake, and of the promenade improvements to be carried out on the north side of the pier.

The new R.C. Church of St. Laurence, Birkenhead, was opened for service on Christmas Day.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.) To India (viâ Brindisi), £1 10s. 4d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

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Front Page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

Situations.

The charge for advertisements for "Situations Vacant or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page advertisements and alterations in serial advertisements must reach the office by Tuesday Morning to secure insertion.

NOTICE.

Bound volumes should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XLI., XLVI., XLIX., L., LI., LIII., and LVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

Received.—Nimrod.—F. S. and Co.—W. G. Marshall.—G. Stanhope.—G. D., Sydney.—S. E. W.

"BUILDING NEWS" DESIGNING CLUB.

THIRD LIST OF SUBJECTS.

D.—A detached stable and coach-house, with residence for groom, suitable for erection in the grounds of a small country house. The stable to comprise two stalls and two loose-boxes, with a separate stall for pony or donkey. Coach-house for four vehicles. A harness-room adapted for use as a man's small day-room. A loft over stable and man's bedroom. Groom's dwelling to have living-room, small scullery and pantry, two bedrooms, and cupboard for store. Separate w.c. for house. Dung-pit and accommodation for men. Scale 8ft. to the inch. Sufficient drawings to show the design, including sketch; all on one sheet of paper to the size stated in conditions. Two elevations sufficient. Style of building left to the competitors.

Drawings Received.—"Corinthian," "Skull and Cross-bones," "Country Bumpkin," "Coaly Tyne," "Vyrnwy," "Fiddler," "Myth."

Correspondence.

FELLOWSHIP OF THE INSTITUTE OF ARCHITECTS.

To the Editor of the Building News.

Sir,—I notice in the issue of the *Citizen* of the 21st inst. a strongly-expressed objection, in the interest of the public and also of everybody directly or indirectly concerned, against the election of gentlemen to the Fellowship of the Institute of Actuaries without having submitted to and previously passed the qualifying examinations. It is an injustice to the public, and an injustice to existing members; and in a similar manner it is an injustice to the public and an injustice to existing members, that persons who have undergone, as a sole qualification, seven years of office drudgery, should, merely upon being proposed and seconded, be elected a Fellow of the Royal Institute of British Architects. The Institute were by no means slow to impose an obligatory examination upon every Associate who sought admission; while the highest dignity it is possible for the Institute to confer can be obtained by any charlatan who may have successfully maintained himself for a period of seven years, upholding by other superior mental assistance the continuity of his practice. It is not equitable to the public, and it is an unqualified injustice to Associates.—I am, &c.,

Charles R. Guy Hall.
17, Victoria-grove, Kensington.

APPLIED MECHANICS FOR ARCHITECTURAL STUDENTS.

Sir,—My attention having been drawn to Mr. E. W. Tarn's series of articles which have appeared in your columns under the above heading, in which, amongst other errors, the writer persists in maintaining that the struts in an ordinary roof truss, when not at right angles to the rafters, are subjected to transverse strains, it becomes necessary to warn students against adopting such novel theories until their examiners have been induced to believe in them.

Fortunately there are a sufficient number of trusses standing throughout the world, with scientifically constructed struts, to make it perfectly certain that the stresses set up in the different members, by forces acting at their points of junction, are direct only; had their designers been wrong, and the writer of these articles right, they would long ere this have all come down with a crash.

In par. 9, Article II. p. 728, again at p. 754 (Building News, Nov. 22), and elsewhere, the writer attempts to prove his case thus:—Despising the too common method of ascertaining the stresses due to the purlin resting over the strut by simply resolving the load along the strut and the rafter, as pointed out by "H. C." in your issue of 29th Nov., he first supposes the strut to be removed, and then puts it back again, evidently forgetting in so doing that, before he removed it, there was a joint connecting its head to the rafter, and that the joint at its foot is in the condition of a hinged, and not a fixed, joint, till finally, in your issue of 13th Dec., he arrives at the extraordinary conclusion that this strut, which is practically hinged at both ends, may be looked upon as if it were fixed in a wall at one end and loaded at the other, and that, therefore, it is subjected to transverse strain.

The same fallacy is repeated in par. 12 of Art. II., in dealing with the stresses in a raking shore, for, after remarking "if there is any tendency to push the shore over at A, it is only the load W which can prevent it," he entirely ignores the pushing-over force; and, taking W as if it were the only force to deal with, resolves it into two forces, P in the direction of, and Q at right angles to, the shore, which latter (represented by a given line, E C), he says, "gives the transverse strain"; in addition to which, in par. 9, dealing with the roof strut, he said, "then E *b* represents the transverse strain."

Now, in any case, the lines E C and E *b* could only represent forces tending to set up transverse strains, and not the transverse strains themselves, as the latter would depend on the leverages at which the forces acted; these forces, however, are purely imaginary ones; but supposing them to really exist, they could not set up transverse strains in a beam which, not being rigidly fixed at its base, would revolve about it if its upper end were free to move outwards, which, again, is one of the conditions of the problem that it should not do. It is the pushing force which brings the weight of the wall into action, and the resultant of these two forces produces a direct compression on the shore.

In Article III. (Building News, 29th Nov.), the writer is evidently dealing with a subject the very groundwork of which he has yet to master. In this system the load line, or force diagram, forms a closed polygon, whilst the stress diagram formed on it, besides being itself a closed polygon, is built up of as many closed polygons as there are joints in the truss; the beauty of the whole being that it proves its own accuracy, step by step, the last line drawn being the key which, if it does not fit the lock and close the polygon, shows at once that there is something gone wrong with the works. Not a word of this, nor of how the nature of each stress set up is arrived at, is hinted at by the writer; all he does in paragraphs 13—19 is to describe how he himself sets to work to draw or copy known diagrams. Had he never seen these particular diagrams he could not have constructed them as described; whilst, after all, diagrams 13 and 17 are wrong.

In diagram 13, had he built up the force diagram, A *f*, properly, he would have discovered

that something was amiss; as, owing to his having only taken into account half the weight of the ceiling and tie-beam (the half carried by the king-post), the polygon would not have closed by a length of line representing the omitted half of the weight; this error stultifies the whole of the stress diagram, except so far as the struts are concerned.

Diagram 17 is incomprehensible, it being impossible to construct a stress diagram on the false assumption that the stress in the horizontal tie is uniform throughout—a conclusion which he arrived at in the last part of paragraph 17 by wrongly arguing that, because with a horizontal tie the three lines *h i*, *h o*, *h k* in diagram 15, would merge into one, that therefore this "line will represent the tensile strain in the tie-rod." The most elementary knowledge of his subject should have prevented his making such a blunder; in addition to which, why should he assume stresses which it is the sole object of his stress diagram to tell him?

I am sorry to have to write so strongly about these articles; but in the interests of your student readers I feel compelled to warn them against being led into the belief that they are worthy of study by the very confident tone adopted by their author in replying to those who have ventured to criticise his writings.—I am, &c.,

H. C. SEDDON.

BUILDING AND 'BACCA.

SIR,—I inclose an advertisement culled from a local almanac, which is, I think, worth your notice. Matters are surely ripe for the Registration Act after this.—I am, &c.,

JOHN TAYLOR, Architect.

Longton, Staffs, Dec. 21.

GREGORY SPICER, Building Surveyor, No. 3, Chadwick-street, Longton. All kinds of Plans, Specifications, and Estimates prepared on reasonable terms. G. S. thanks his friends for their many past favors, and trusts now he has removed to Chadwick-street to receive not only a continuance of past support, but an extended list of patrons. Try SPICER'S SUPERIOR TOBACCOS, and his general stock of Tobacconist's Goods. Dark, Light, Cavendish, Twist, Cake. All kinds of excellent Packetted Tobaccos. Choice Cigars, all of best brands.

CHIPS.

The antiquities discovered at Falerii have now been arranged in the old Villa of Pope Julian II., beyond the Piazza del Popolo, at Rome, and will soon be opened to the public. On the ground floor of the Villa is a sarcophagus from Gabii, formed of the trunk of an oak, within which a skeleton still lies.

Messrs. J. Constantine and Son have just fixed one of their patent convoluted stoves at the parish church, Tadcaster, near Leeds. The work has been carried on successfully, and the church is effectually warmed in all parts.

Mr. Henry Croom Johnson, C.E., of St. James's-street, Hereford, died on Tuesday week in the 70th year of his age. Mr. Johnson has been connected with the Great Western Railway for upwards of 50 years, having joined the service under Mr. John Hammond in 1839. Subsequently he was engaged with Mr. Bertram in surveying and setting out the line between Reading and Bristol. Later on he served with Mr. Edward Slaughter on the same system between Swindon and Chippenham; also with Mr. Robert Brodie between Exeter and Newton Abbott, and on the Swindon and Gloucester lines, and over the Oxford and Cheltenham scheme. In 1843 Mr. Johnson was engaged upon the line with Mr. Brodie between Neath and Milford, also in surveying and setting out of the Carmarthen and Cardigan line; with the exception of the extreme north and west, there is hardly a section of the Great Western system with which the deceased gentleman had not at some period of his active life been connected.

On Saturday the Bishop of Ripon consecrated the newly-erected portions of St. John's Church, Moor-Allerton. The alterations have been of an extensive nature, including the addition of transepts, chancel, two vestries, and organ chamber. The new portions have been erected partly on the site of the nave and choir of the old church, and partly on the old churchyard. They have cost in all about £2,000, and have given an additional 140 sittings. The special gifts have included a pulpit, a pulpit lectern, altar-rails, brass eagle lectern, altar hangings, brass cross, altar linen, east stained-glass window, font and ewer, oak chairs, and a peal of eight tubular bells. Mr. Ambler, of Leeds, has been the architect for the alterations, which have been carried out by the following:—Mason work, Messrs. W. Wilson and Sons, Headingley; and joiner work, Messrs. Craven and Umpleby, Hartley-hill.

Intercommunication.

QUESTIONS.

[10179.]—**Stanchion.**—I am building shop premises, and will be glad to know what weight I can carry on a stanchion of cast iron of H section, 9in. deep and 11ft. high, the flanges 5in., and the thickness 1in. The formulæ for finding strength of pillars of this section for both cast and wrought iron will be thankfully received.—ARCHITECT.

[10180.]—**Ornamental Brickwork.**—Can one of your obliging readers tell me of any well-designed brick buildings, in or near London, where moulded work is to be seen?—A SKETCHER.

[10181.]—**Brick Band to Bay Window.**—Will a practical reader give an example of working a canted bay 18in. thick?—L. A.

[10182.]—**Painting Ironwork.**—Which paint is the most durable for outside ironwork—I mean as regards ingredients and colour—and how should the parts that are rusty be treated? Some say the rust is better left on, and not scraped off.—A. L.

[10183.]—**Renaissance Decoration.**—Are there any published drawings of the "Appartamenti Borgia" in the Vatican Palace? By whom were these famous frescoes painted? Any particulars will oblige—BORGIA.

[10184.]—**Ventilation for Room Lighted by Gas.**—Can anyone suggest a simple means of affording escape to the heated air at the top of a room lighted by gas, the heat being very great at times? A perforated ceiling, with tubes leading outside, has been suggested; but this would be costly, and necessitate a new ceiling. Other suggestions will be gladly received by—SUBSCRIBER.

[10185.]—**Ranges.**—Is there any work published on the construction of open and closed ranges?—F.

[10186.]—**Echo.**—Can any reader tell me how to cure an echo in a schoolroom that I have just built? The room is 36ft. 6in. by 16ft. 6in., and 20ft. high. The ceiling is flat, ordinary lath-and-plaster, with coves all round about 2ft. 6in. deep. There are three windows on the one side, and two doors and two chimney-breasts on the other side; the end walls quite flat. The walls are panelled 5ft. high, and plaster above.—SUBSCRIBER.

[10187.]—**Filtration.**—Will anyone give particulars, from practical experience, of some simple and effective method for the filtration of water to be used for laundry purposes. The water will be collected from the roofs.—INQUIRER.

[10188.]—**Furniture.**—Can any of our readers give me the probable date of a "Grandfather" clock which I have? It has a handsome brass dial, with scroll-work of dolphins and female heads, and on a circular boss, fixed to the upper part of the dial, is the name "Thomas Martin, London." The case (about 7ft. high) is black, covered with Japanese figures and designs in gold. Was this style of decoration, which is also used for cabinets and other articles of furniture, an English imitation of Japanese work, or really executed by foreign workmen, and what is the date of its introduction into this country.—A. C. W.

[10189.]—**Dimensions of Chancel Fittings.**—I should like to be informed of the proper length for choir stalls and width of same, also of centre passage-way, to a church for about 800 worshippers.—ECCLESIA.

[10190.]—**Sound-Proof Partition.**—What are the best materials and construction for a partition of adequate strength as between two prison cells, but of minimum thickness, sufficient to prevent conversation between prisoners?—ROCCO.

REPLIES.

[10168.]—**Party-Walls.**—If there is space, I should advise "Architect" to build a 20in. wall hollow, composed of two-brick thicknesses, with a cavity of 2in. or 2½in. A 12in. wall, hollow, will, however, be better than a 9in. solid wall to prevent the transmission of sound. The galvanised cramps should be placed at every fifth course and at intervals of about 2ft. 6in. apart; the ends should be well turned out and jagged.—G.

[10177.]—**Hot-Water Apparatus.**—Would Mr. C. F. Lear say if the same or similar action takes place in the iron pipes, or in the tanks only, and if any such results accrue from this water cold? Also if the water is hard or soft? Is the iron pipe he names galvanised or not? In the *Journal* of the Royal Agricultural Society for 1875, Vol. II., Dr. Voelcker gives an exact parallel case to the one Mr. Lear names.—PROVINCIAL BUILDER.

The memorial stones of a Spiritualists' Hall now being built between Bradford-street and the Midland-road, Walsall, were laid last week. The hall is to be Classic in character, with Corinthian columns and massive cornices in the front elevation, which will be built with pressed and moulded bricks. The internal arrangements will include two halls 54ft. by 36ft., ante-rooms, lavatories, and other rooms on two floors, and cellars and cooking kitchens in the basement. The total cost is expected to be about £1,200. The architect is Mr. W. E. Jackson, Wallsall Wood, and the builder is Mr. R. Evans, Thorpe-road, Walsall.

The first annual dinner of the Civil Royal Engineer Establishment staff took place at the Holborn Restaurant on Monday last, the 23rd inst., Mr. J. Lewis Thomas, chief surveyor, in the chair.

A serious fire occurred at the sawmills of Messrs. Charles Baker and Co., Canons' Marsh, Bristol, on the 19th inst. The premises, machinery, and stock were destroyed. The damage is estimated at about £5,000.

LEGAL INTELLIGENCE.

THE CONSPIRACY BY A WARRINGTON BUILDER AND HIS FOREMAN.—In the Crown Court at the Liverpool Assizes, on Wednesday week, before Mr. Justice Grantham, Henry Collin, builder, of Warrington, and John Kermode, his foreman, surrendered to their bail to take their trial on a charge that they did at Liverpool, between the month of May and the month of September, 1889, conspire, by false pretences, to obtain of and from the Commissioners of her Majesty's Works and Public Buildings £23 0s. 3d., the moneys of the said Commissioners of her Majesty's Works and Public Buildings, with intent to cheat and defraud them of the same, and with having, at Liverpool, conspired to cheat her Majesty's Commissioners of divers sums of money by altering certain time sheets. The prisoners pleaded guilty. The particulars were published in our issue of November 15 last, p. 684. Collin was sentenced to a week's imprisonment, and to pay a fine of £100; Kermode was fined £10.

RE J. WEBB.—A first meeting of creditors took place on the 19th inst. in the case of James Webb, of Belsize-park-gardens and Piccadilly, artist, whose accounts show gross liabilities £51,750, of which £41,115 are fully secured, and £4,320 expected to rank, with an estimated surplus in assets of £10,506. The debtor has been engaged in large building operations, principally in the neighbourhood of Worthing. Mr. Attree was appointed trustee under the bankruptcy.

LIGHT AND AIR CASE.—MYERS v. CATTERSON.—(Supreme Court of Appeal, Dec. 16, before Lord Justice Cotton, Lord Justice Bowen, and Lord Justice Fry.)—This case raised a new and important question as to the extent of the doctrine of implied grant in light and air easements. In 1863 the London, Chatham, and Dover Railway Company sold to Solomon Myers, the deceased plaintiff, a piece of land in Newington-causeway, on the south-west side of the railway, and upon this land he built a house. The windows of the house faced the railway, which here ran over a series of brick arches, from which the plaintiff's house was distant about 8ft. The conveyance of 1863 recited that the company required all the land other than that sold to the plaintiff for the purpose of constructing their railway. It contained no express grant of a right to light. The plaintiff alleged that from 1863 he had enjoyed access of light to his windows through the openings of two of the arches. In 1870 the defendant acquired from the railway company the fee of the land on each side of the two arches, and a lease for 30 years of the arches themselves. In November, 1887, the defendant erected buildings on the north-east side of the railway, a short distance from the openings of the arches, and in December, 1887, he blocked up with wooden hoardings the openings of the two arches on the side nearest the plaintiff's house. From 1872 the arches had been used for the storage of heavy machinery, which blocked out the greater portion of the light coming through the openings. The plaintiff brought an action to restrain the defendant from obstructing the light through the arches, and upon his death, in 1888, the action was continued by his widow. Mr. Justice Kekewich granted an injunction as to the hoarding, and directed an inquiry as to the damages occasioned by the erection of the buildings. The defendant appealed. Mr. Neville, Q.C., and Mr. Russell Roberts, for the appellant, contended that the recital in the conveyance of 1863 that the land retained was required for the purposes of the railway was inconsistent with the notion of an implied grant to the plaintiff of a right to light, and that the plaintiff was not entitled under the Prescription Act, by reason of the interruption of his enjoyment of the light in 1872. Mr. Warmington, Q.C., and Mr. Swinfen Eady, for the respondent, upon waiving their right to the inquiry as to damages, were not called upon. The Court dismissed the appeal. Lord Justice Cotton, in delivering judgment, said that the question was whether there was any implied obligation on the part of the railway company not to obstruct the plaintiff's light. If the owner of two plots of land, on one of which a house was built, sold the plot with the house upon it, then there was an implied obligation, contract, or covenant on the part of the vendor not to interfere with the access to light over the portion which he sold. That was the law in the case of an ordinary landowner, but this was the case of a railway company, and it was said that it would not be presumed that a railway company would contract to do anything which might interfere with the construction of their railway, and that the whole of the land was stated to be required for that purpose. The implied contract entered into by the railway company must be subject to this limitation—that they were not to be prevented from doing whatever was necessary for the purposes of constructing their railway. It was argued that this really made the obligation dependent upon the will of the railway company, and that that was inconsistent with the idea of an implied covenant. But that was not so. What was necessary for the construction of the railway was not a matter which depended entirely

upon the will of the railway company. He therefore held that the railway company, as owners of the land which they sold to the plaintiff, entered into an implied obligation not to do anything on the land retained by them so as to interfere with the plaintiff's reasonable enjoyment of the land sold except what was necessary for the construction of the railway. Then was the hoarding required for this purpose? Certainly not. The arches were leased, and the tenant had put up a hoarding for his own benefit. Even assuming that the hoarding was indirectly for the benefit of the railway company, it was not put up for the purpose of constructing the railway. His Lordship then discussed the evidence as to the extent to which the light was diminished, and agreed with the conclusions of the learned Judge below. Referring to the evidence of scientific witnesses, his Lordship observed that he desired to say nothing against scientific witnesses, but in his Lordship's judgment the evidence of witnesses who deposed to the facts was much more reliable. One knew how frequently scientific witnesses of great skill and ability were found by the light of subsequent events to be wrong in their conclusions. In his Lordship's opinion the appeal failed. Lord Justice Bowen was of the same opinion. Lord Justice Fry concurred.

DELAY IN LETTING LAND UNDER A BUILDING CONTRACT.—At the recent Liverpool Assizes, before Mr. Justice Charles and a special jury, James Thomson, a builder, of Liverpool, brought an action against Mr. Mackenzie, a large contractor and owner of land in and around Liverpool, to recover damages for breach of contract. On February 1, 1886, a contract was drawn up by which the defendant was to sell for building purposes to the plaintiff a large plot of land in Belmont-road. The purchase money was to be £18,000, payable in five years, and the plaintiff agreed to make streets and build on the land. It was agreed that the plaintiff could call upon the defendant to give him conveyance of any particular plots of the estate which might be completely built upon. This was done to assist the plaintiff to make his financial arrangements either for sale or mortgage, and so get capital to go on with the remainder of the building operations. The amount of his capital was £12,500, and he borrowed £7,000 from the defendant. When several conveyances of built-up plots had been made the defendant objected to grant a conveyance of a piece of land on which the plaintiff had built 113 houses, because he said he ought to be paid a proportion of the money advanced as the building went on, and not wait until the end of the contract. Chancery proceedings followed, and it was decided that the defendant must give a conveyance. The plaintiff was delayed building for a season, and he now claimed damages in respect of it, as well as for loss owing to his capital lying idle. The jury found for the plaintiff, damages £1,548.

St. John's Church, Wakefield, was reopened on the 19th inst. by the Bishop of Wakefield. For some years past the work of restoring the church has been going on, the necessary alterations and improvements being undertaken in sections at intervals. Recently the side galleries and arcades have been removed and new stone arches substituted for the latter. A gallery has been erected at the west end, and the organ has been enlarged and improved. All the large and old-fashioned pews have been removed, and neat seats or open stalls of old English oak are shortly to take the place of the chairs now in use. The work is being carried out in accordance with the plans of Mr. J. T. Micklethwaite, F.S.A., of Westminster. Mr. C. W. Richardson, of the firm of Messrs. Simpson and Richardson, of Wakefield, is superintending the work as resident architect.

Internal alterations forming a memorial to Dr. William Chambers are about to be carried out in St. Giles's Cathedral, Edinburgh, from designs by Mr. MacGibbon. The alterations embrace the removal of the wall between a chapel and the north aisle of the cathedral, and the insertion of moulded jambs in the aperture surrounded by an arch. The present plaster roof of the chapel will be removed, and a stone vault substituted with groins and shafts. The old boss lying outside, on the south-east of the cathedral, is to be raised in the centre of the new vault of the chapel. The new floor of the chapel will be laid with two marble steps and a broad marble border all round. The centre, which will also be of marble, will contain the arms of the late Dr. Chambers. The memorial tablet will be of bronze.

A London correspondent says the Dean and Chapter of St. Paul's were so certain as to the ultimate result of the legal proceedings concerning the reredos that after the decision of the Court of Queen's Bench, which has now been reversed, they ordered Messrs. Brindley and Farmer to continue and complete the work on the reredos by adding to it a wing on each side of the choir, so bringing the marble up to the oak stalls.

Our Office Table.

THE Architects' Registration movement is making progress in the Australian Colonies, and Bills making registration compulsory have been brought before several Legislatures, including that of Victoria, by the local institutes of Architecture. The *Australian Builder and Contractor* for Oct. 26, just to hand, states that at the last meeting of the Victoria Architectural and Engineering Association held on October 21st, Mr. E. Wilson-Dobbs read the report of the committee appointed to consider the proposed draft of the new Regulation Bill, which dealt with the subject in a very complete manner, and pointed out some considerable desirable alterations. The draft having been approved by the meeting, the secretary was instructed to return the document and report to the special committee. On the motion of Mr. A. J. Macdonald, seconded by Mr. Wilson-Dobbs, it was resolved "That the Bill for Registration of Practitioners in Architecture, prepared by the Committee of the Royal Victorian Institute of Architects, meets with the hearty approval of this Association, and is regarded by us as a decided step in the right direction."

THE "betterment" clauses in regard to the Strand Improvement Bill is enlisting a great deal of attention. Some writers in the *Times*, including Mr. G. Shaw Lefevre, approve the principle as applied to the Strand, others as strongly oppose it. We are of opinion that the principle of "betterment" is only fairly applied to those owners who are improved by the proposed alteration, but that it cannot be fair to other owners who are not benefited in the slightest degree. Why, for instance, should the owners and occupiers of houses be taxed in the neighbourhood of public buildings like Somerset House? The improvement contemplated will only affect one portion of the Strand, the owners in Holywell-street; it cannot improve any other portion—on the contrary, the removal of the block must rather be to the detriment of residents east and west. By removing the obstruction the traffic will be facilitated;—certainly the property will not derive any advantage.

A CASE raising the question of the legal right of a principal to retain possession of his apprentice's indentures on the completion of articles was recently raised by an action in a Yorkshire County Court, and, although settled privately, has some interest for architects and their pupils. In this instance A. B. articled himself in October 1887 to C. D., a quantity surveyor in practice in a large commercial town, for two years, having the articles prepared by A. B.'s solicitors, upon which was paid a premium of £100. Upon the expiration of the term C. D. refused to give up the indentures, giving, however, no reason for his not doing so. A. B. thereupon placed the matter in the hands of his solicitor, and legal proceedings were instituted for their recovery. An arrangement was effected, but C. D. then objected to pay costs, and the action went on. On the eve of the hearing of the case, however, C. D. listened to wiser counsels, and delivered up possession of the indentures, paying all costs into court.

AT the final meetings of the Executive Committee and of the Council of Guarantors of the Manchester Royal Jubilee Exhibition, 1887, a statement of accounts was read, showing a net surplus of over £43,000. It was resolved that the surplus should be handed over to the Manchester Whitworth Institute, for which a charter has been obtained, and which is being established by the legatees of the late Sir Joseph Whitworth. Of the surplus so transferred a sum of £10,000 will be appropriated to the Manchester School of Art, as part of the institute, for the erection and equipment of an additional wing, to be called the Royal Exhibition Jubilee wing (or section); a sum of £20,000 will be appropriated to the purchase of works of art of a fine and decorative kind, to be placed in the galleries or museum of the buildings to be erected in the Whitworth Park; and the balance will be appropriated towards the equipment and building of a new technical school as part of the Whitworth Institute. By this disposition of the surplus, worthy and befitting memorials of the very successful exhibition at Manchester will be instituted.

A LECTURE on "J. F. Millet: His Life and Opinions," was given before the Edinburgh Art Students' Association last week by Mr. James Paterson, R.S.A., in the National Scottish Portrait Gallery. Mr. H. E. Littlejohn, the President of the Association, occupied the chair. Mr. Paterson sketched in detail the early life of this painter. He told of the struggles of the son of the Normandy peasant in connection with the prosecution of his art studies, and traced his gradual rise into prominence among the painters of his day until the greatness of his talent and the worth of his works became generally recognised. The influence which Millet's life and work had exercised on art had been wholly for good; and he awarded Millet credit for the highest expression of the genius of painting of any artist since the Middle Ages. His work had given those who followed after him a great impulse in the search in nature for fresh impressions. He had taught that the foundation of art was to be found in impressions coming from Nature herself, and in the lecturer's mind Millet would always occupy a unique place as the greatest painter who had shown the beauty of the sad things in the world.

MESSRS. ARCHIBALD SMITH AND STEVENS, of James-road, Battersea, have made a reputation as lift manufacturers and hydraulic engineers second to none, and mainly by their intelligent application of the self-sustaining or automatic principle which they have successfully elaborated in connection with elevators. Their new catalogue for 1890, which should be in the hands of all architects and builders, dwells particularly on the merits claimed for their arrangement introduced in 1888, which they assert insures a threefold greater certainty of grip, a descending motion free from jerks, the greatest degree of silence yet attained, no waste of power by brake while lifting, no waste of power by worm or differential gearing, and the absence of all ratchets, clicks, or catches. The lifts and hoists are adaptable to all purposes, commercial and domestic, and the past experience of the makers is an abundant guarantee of successful action and good work.

MEETINGS FOR THE ENSUING WEEK.

FRIDAY.—Architectural Association. "Spires, Towers, and Domes," by Sydney B. Beale. 7.30 p.m.

Architectural Association, 9, Conduit-street, W.—January 3rd. Paper on "Spires, Towers, and Domes," by Sydney B. Beale, Esq. 7.30 p.m.
FRED. R. FARROW. } Hon. Secs.
ERNEST S. GALE. }

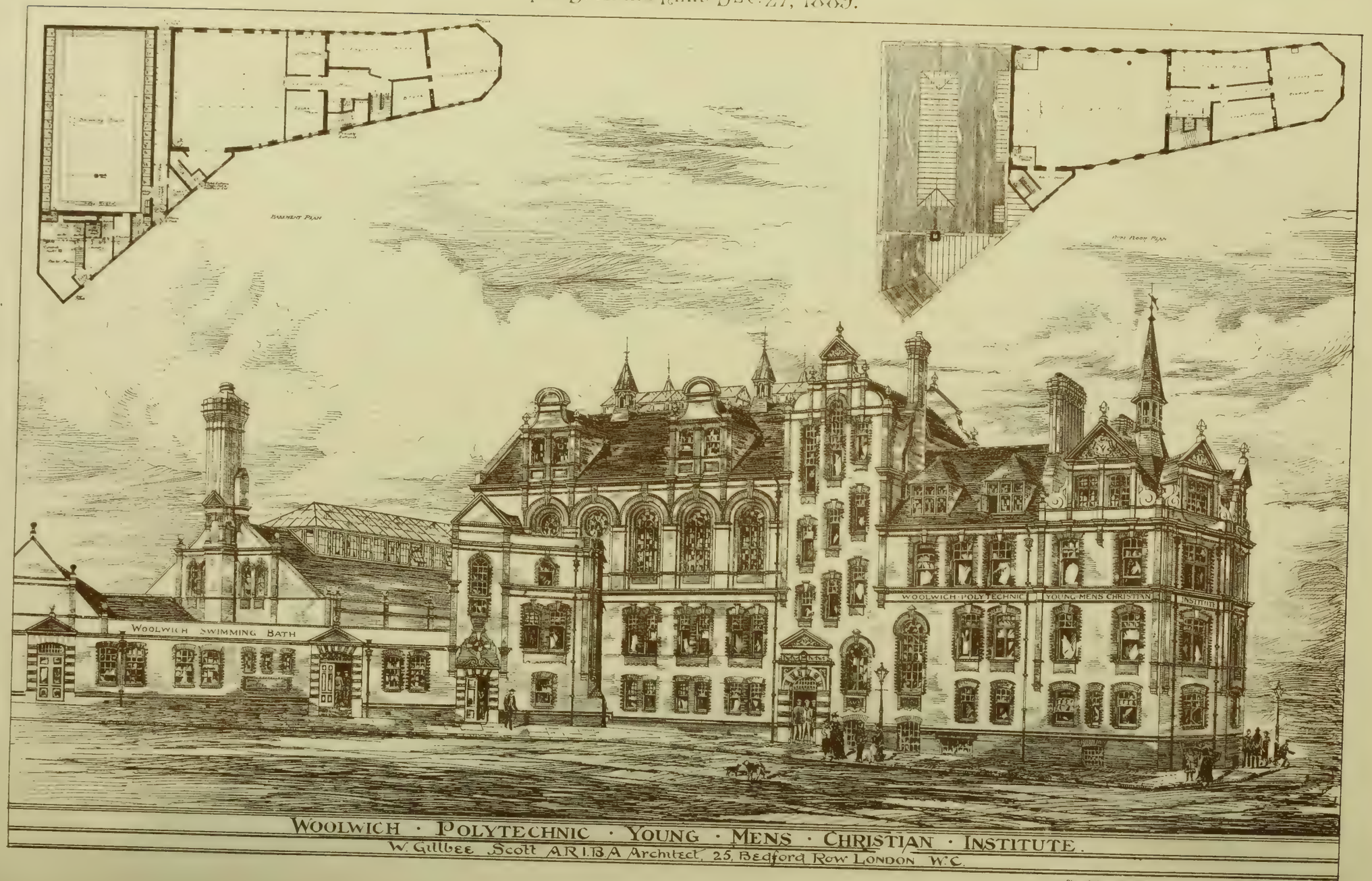
CHIPS.

At the County Down presentment sessions held at Downpatrick last week the resignation was accepted of Mr. Henry Smyth, the county surveyor, and a superannuation allowance was voted him with thanks for his services. Mr. Smyth, who retires owing to failing health and increasing years, has been in the service of the county since 1846.

At Kensal Green Cemetery on Thursday in last week the remains of the late Mr. W. J. Bush, C.C., were removed from the catacombs under the chapel and placed in a mausoleum, which has been erected by the family for their reception. The mausoleum is composed of Sicilian marble, on a polished granite base, and is in the Decorated Gothic style, with a pair of bronze metal doors. The architects are Messrs. Hammack and Lambert, and the sculptor is Mr. E. M. Lander, of Kensal Green.

On the south side of the tower of Colebrooke Church Mr. Harry Hems has just erected a sundial. The face is slate, the gnomon gunmetal, the surroundings red Corsehill stone. The style is Jacobean. At the base are cherubim, fruit, and flowers; at each side fluted pilaster columns surmounted by carved capitals, and in the pediment are sculptured emblems of mortality and the swift pace of time. The motto inscribed on the dial reads: "Watch and pray, Time flies away."

Major-General Hutchinson, Board of Trade Inspector, made an examination on the 18th inst. of the Utley section of the Keighley Tramways. The new section starts from the end of the Papermill Bridge section at its Church Green terminus, and runs with easy gradients along North-street and Skipton-road, past the cemetery. The length is about a mile and a half. The contract for the new section amounts to about £6,000. Major-General Hutchinson was accompanied by Mr. R. B. Broster (engineer to the company), and Mr. Nicholls, of Messrs. Winnard and Nicholls, Wigan, the contractors.



WOOLWICH · POLYTECHNIC · YOUNG · MENS · CHRISTIAN · INSTITUTE.

W. Gilbee Scott A.R.I.B.A. Architect, 25, Bedford Row London W.C.

Photo Lithographed & Printed by James Akerman, Queen Square W.C.

Shops & Residences
Shaftsbury Avenue W.C.

Messrs. Martin & Purchase
Architects
Mansion House Chambers E.C.

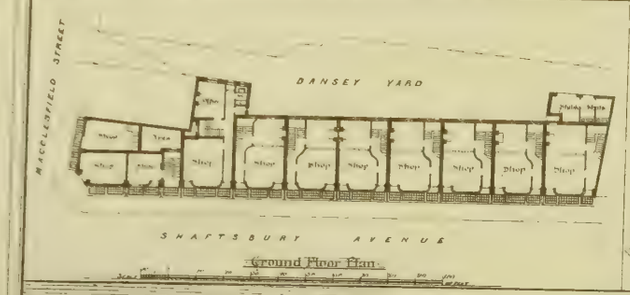




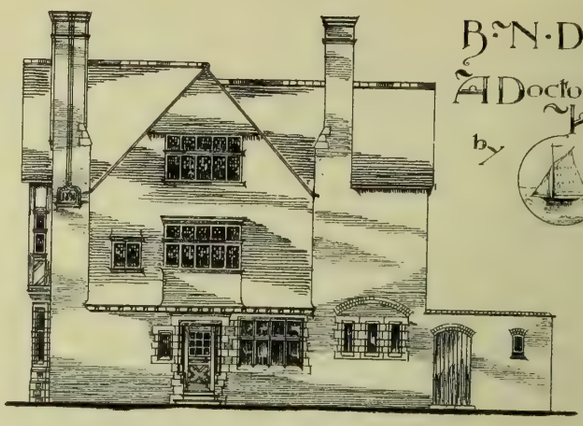


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B·N·D·C
A Doctor's House
by THE RED ROVER

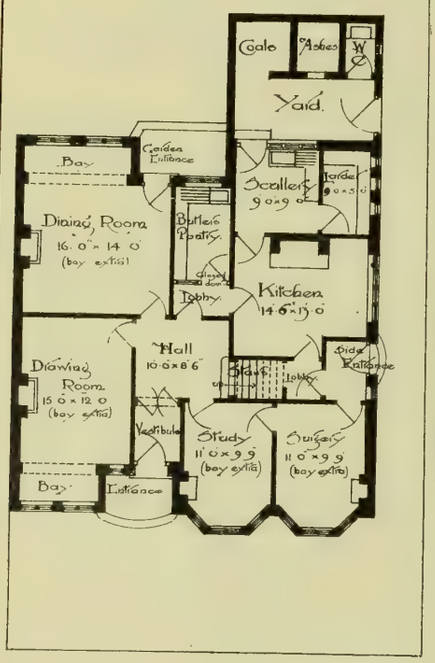


FRONT ELEVATION

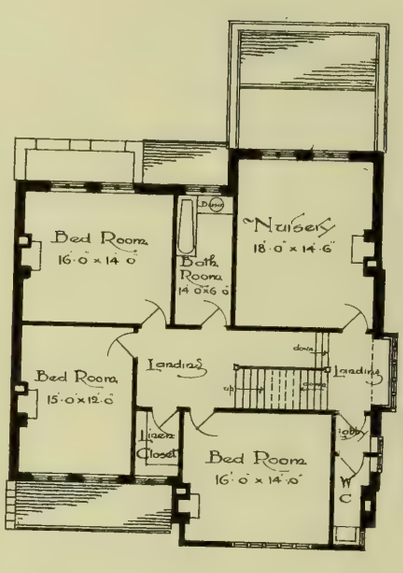


SIDE ELEVATION

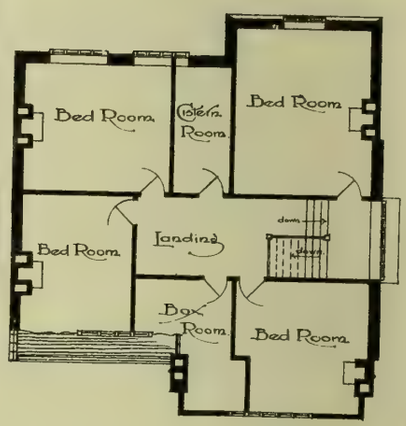
DESIGN PLACED FIRST



GROUND PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

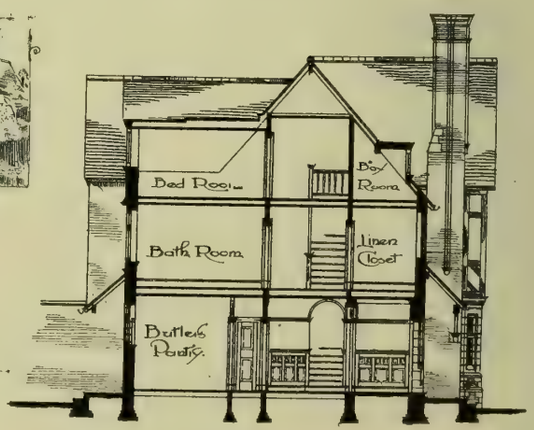
B·N·D·C
A Doctor's House



BACK ELEVATION



by THE RED ROVER

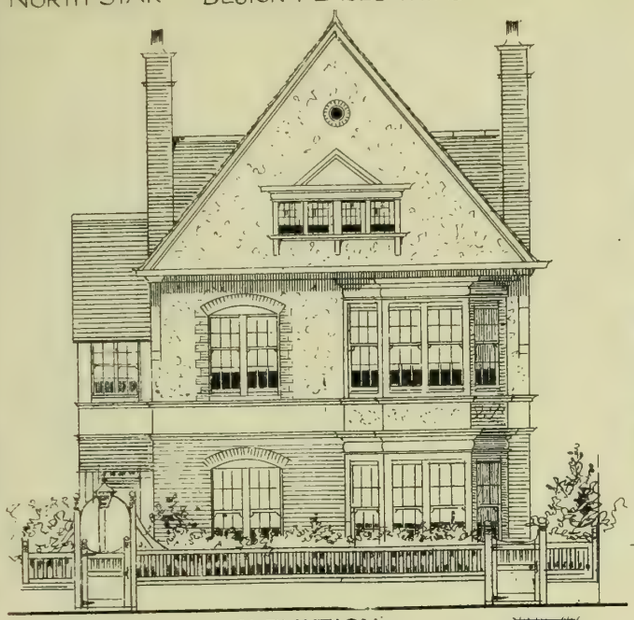


A SECTION

Scale of Feet

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NORTH STAR DESIGN PLACED THIRD

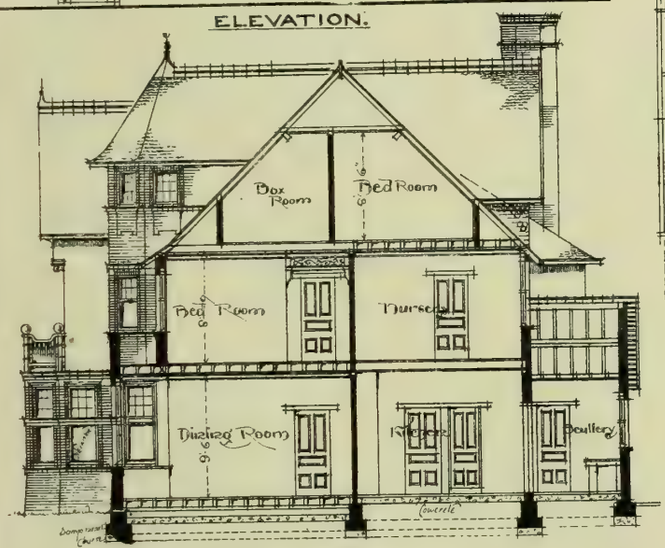


ELEVATION.

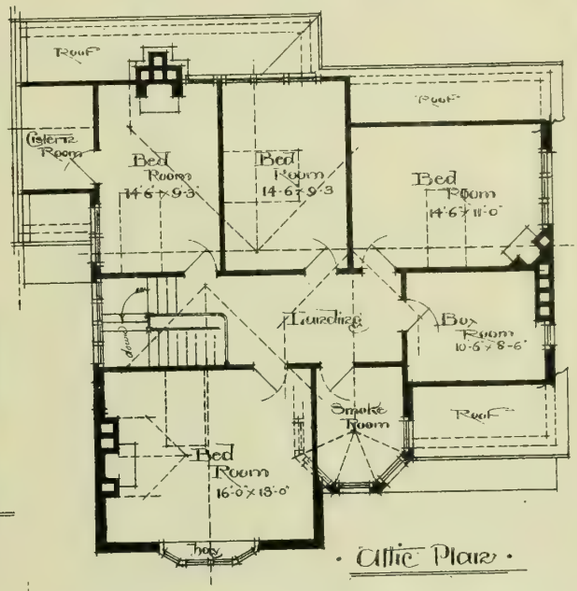
DESIGN PLACED SECOND



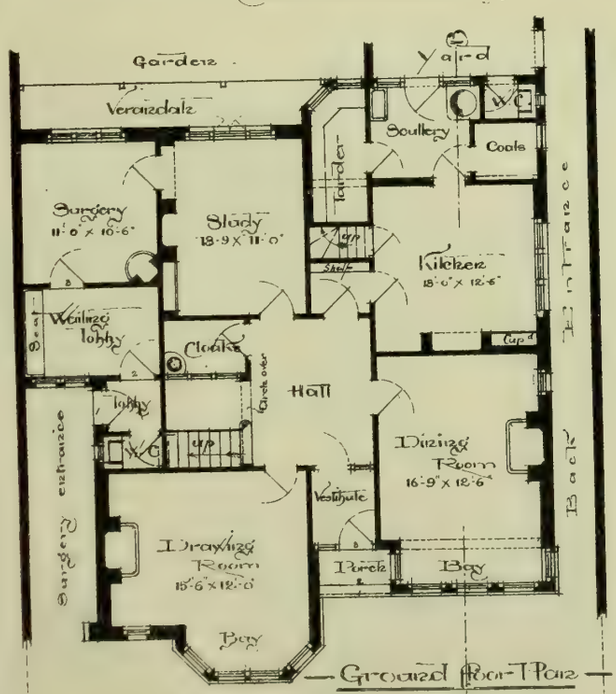
Front · Elevation ·



Cross Section on line C.D.

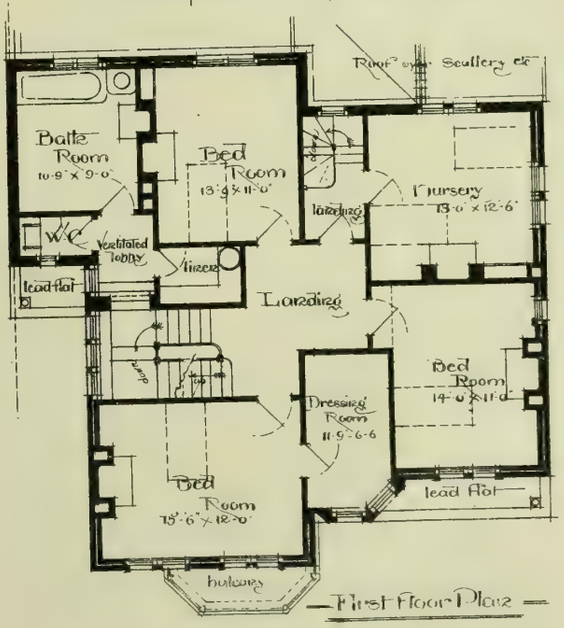


· Attic Plan ·



— Ground Floor Plan —

40'-0"



— First Floor Plan —

· Building News Designing Club ·

· A Doctor's House for a Country Town · by "Myth"

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Free North Church

Selected Design for

Inverness

Ross & Macbeth Architects

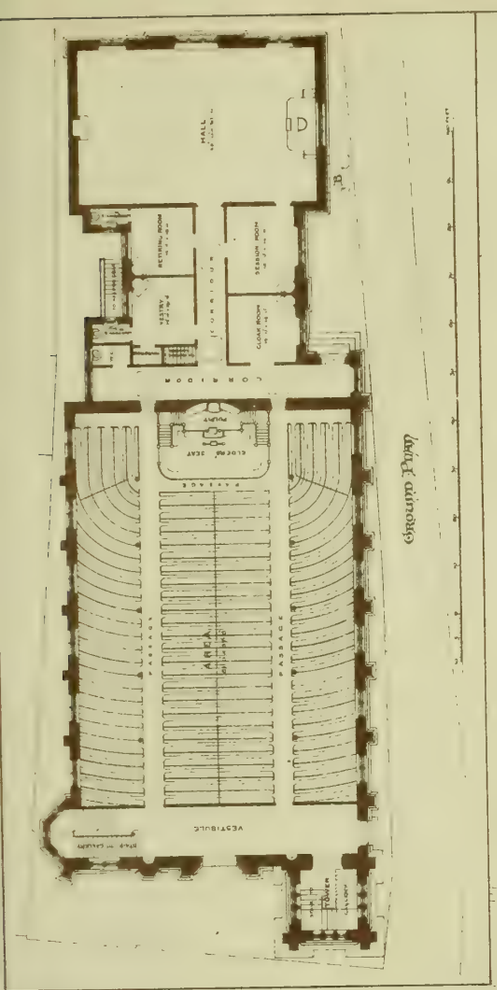
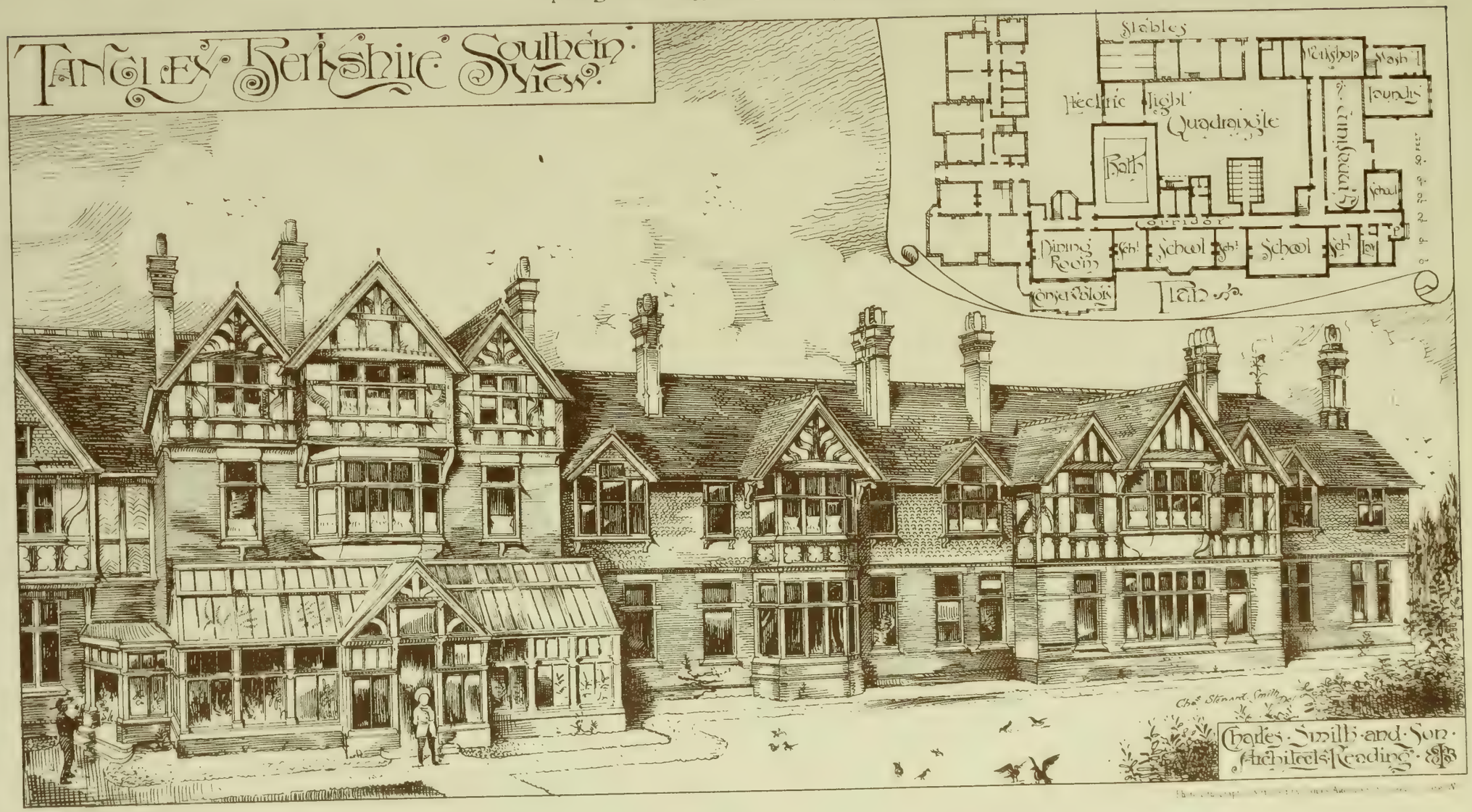




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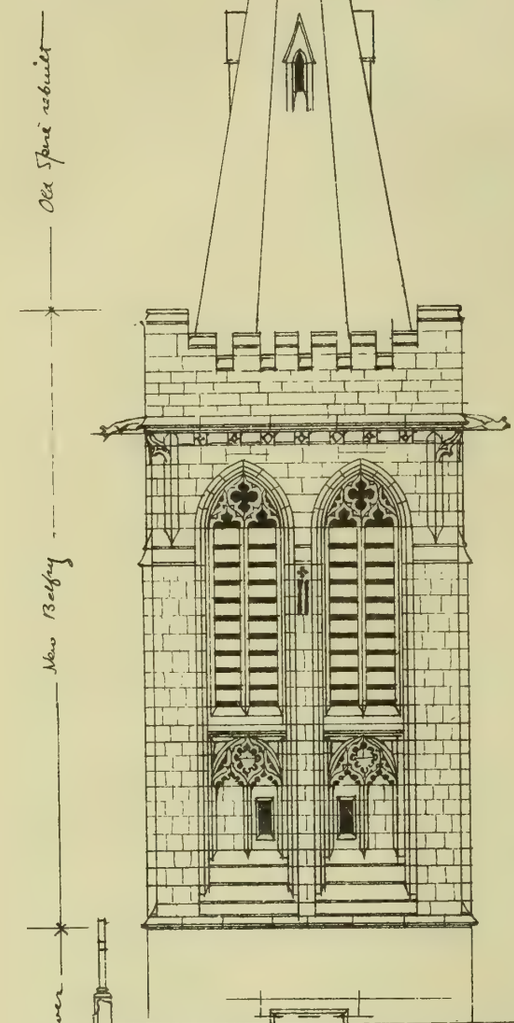
TANGLEY'S BERKSHIRE SOUTHERN VIEW.



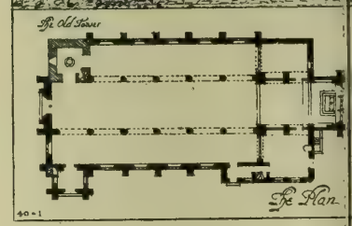
Charles Swith and Son
Architects Reading

S. PETER'S CHURCH
RUDDINGTON near NOTTINGHAM.
rebuilt A.D. MDCCCLXXXVIII
Rev Frank Boyketh M.A. Vicar

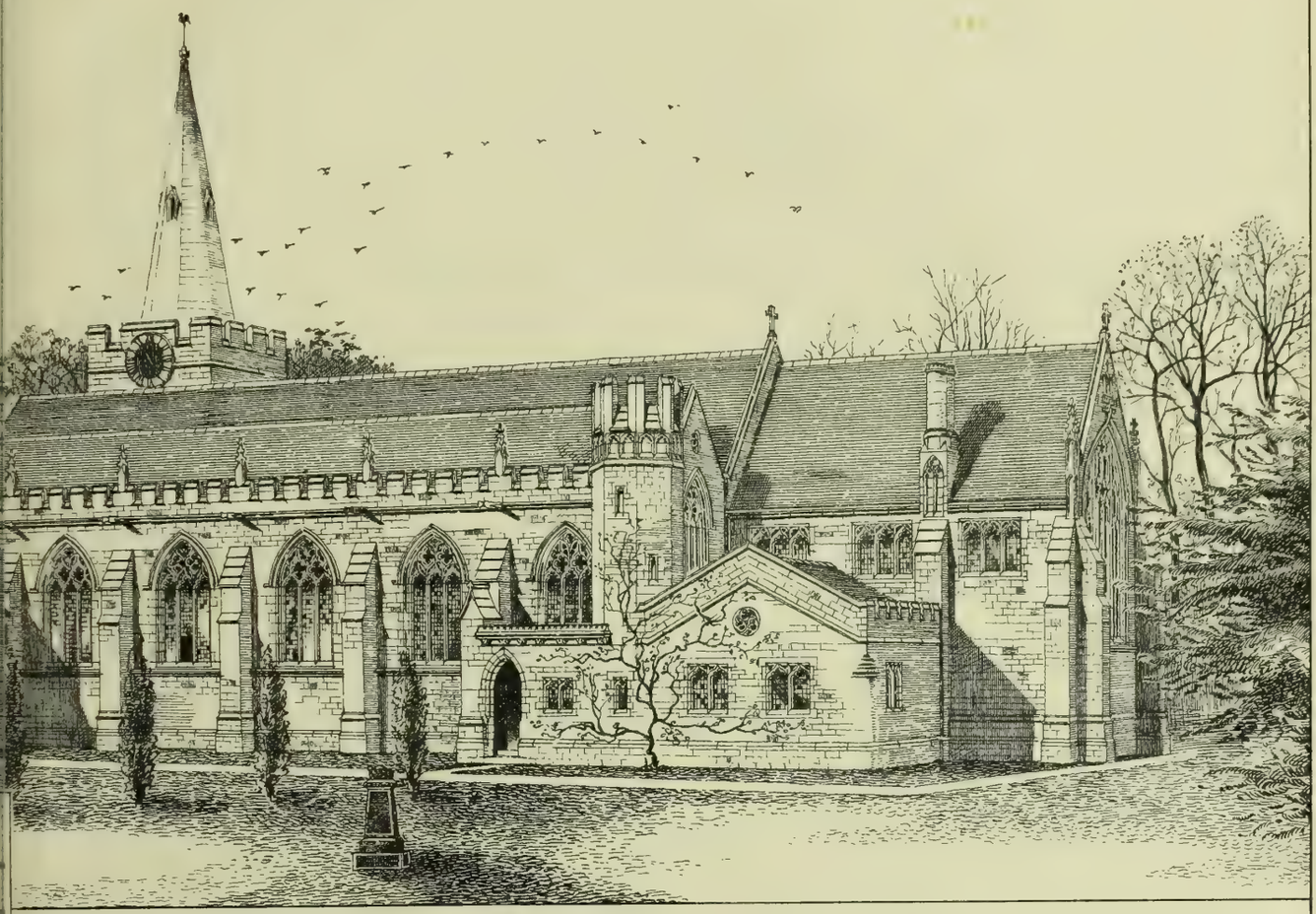
Bell and Roper
Architects







South Elevation facing the road.



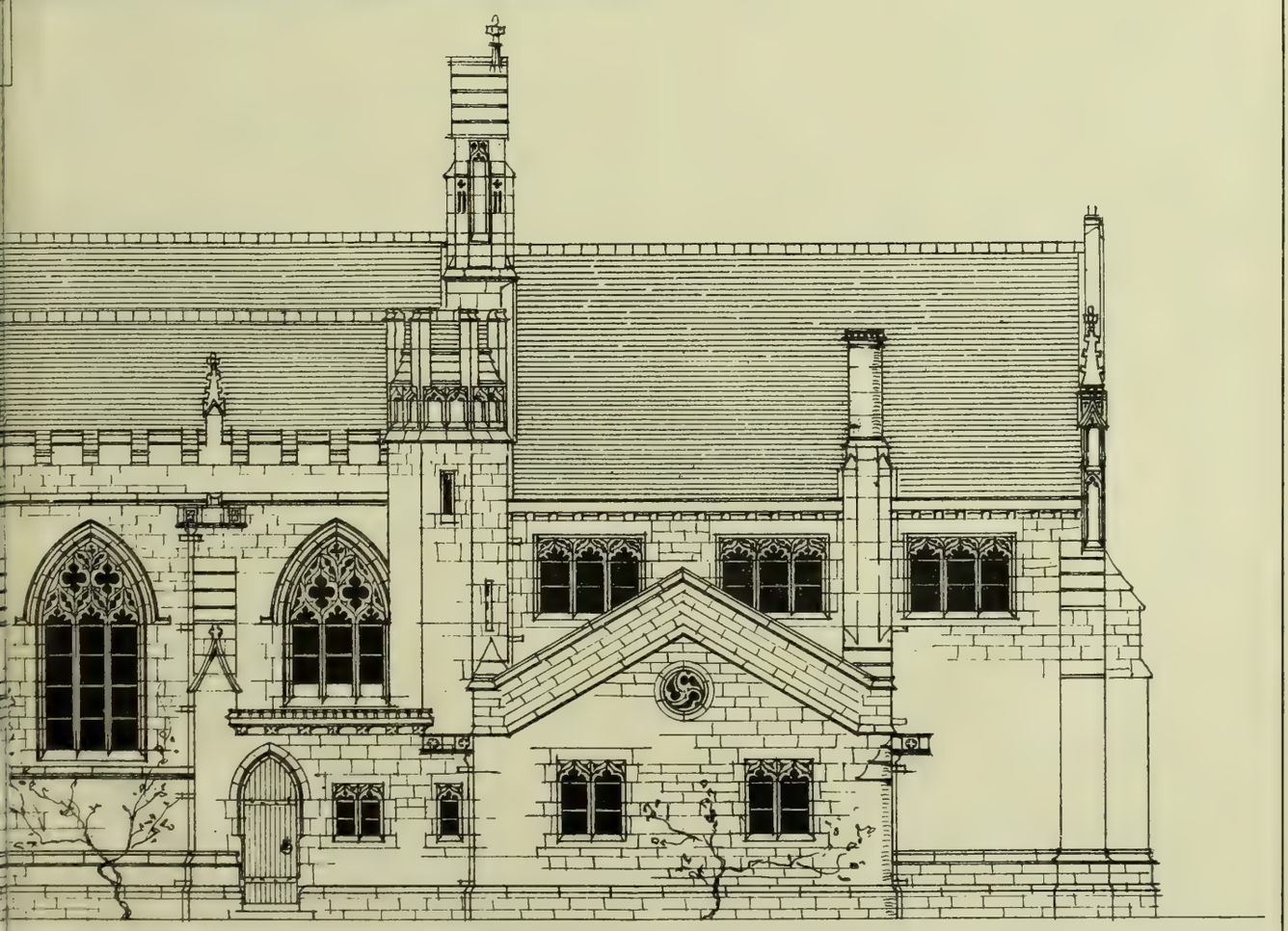


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